Northern
Engineering (Sheffield) Ltd

NES TECHNIFLATE®

INFLATABLE SEALS
PRODUCT INFORMATION

Northern Engineering (Sheffield) Ltd (NES) is an advanced materials company, providing bespoke engineered solutions with rubber polymer materials.

www.northerneng.co.uk

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NES TECHNIFLATE®

CONTENTS

INTRODUCTION

Northern Engineering (Sheffield) Ltd (NES) is an advanced materials company providing innovative bespoke engineered solutions with rubber polymeric materials (http://www.northerneng.co.uk)

Based in the UK, NES is a wholly owned subsidiary of Sanders Industries head-quartered in the USA (http://www.sandersind.com/). NES has the advantage therefore of belonging to a stable, global organisation with the appetite for long-term investment.

Why select NES TECHNIFLATE®?

1. NES is a responsive and versatile engineering organisation: innovation through rapid design and development work

2. NES is well suited to low or high volume work, producing components and sub-assemblies often challenging in terms of design and application

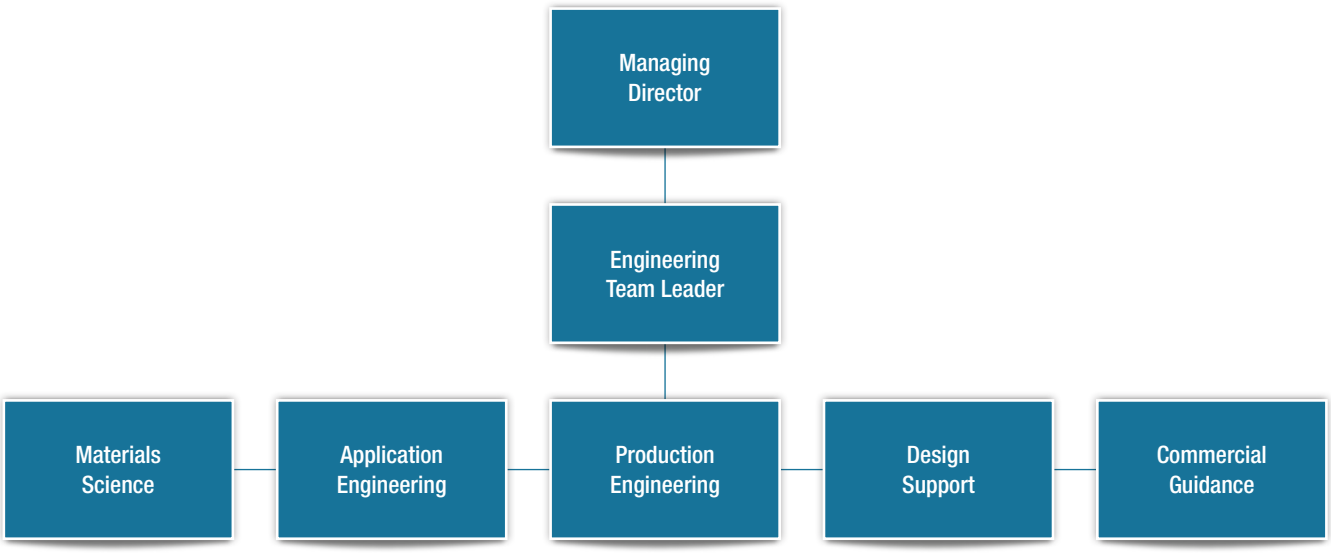
3. NES TECHNIFLATE® inflatable seals are made from raw materials processed in-house under tight quality controls (AS 9100 Rev C aerospace quality system) using precision monitoring devices

4. NES TECHNIFLATE® inflatable seals are made using only the highest grade, 100% pure materials; NES is a long-term DuPont™ licencee, and has secure long-term supply chain partnerships with such high quality vendors

5. NES TECHNIFLATE® inflatable seals can be moulded in one piece or extruded and joined using NES' highly developed hot-vulcanisation process. This gives NES flexibility in design complexity. NES' market-leading vulcanisation process provides superior joint strength

6. NES enjoys the engineering challenge and is able to work closely with its customers to ensure the NES TECHNIFLATE® product matches the specific needs of each individual application (see page 9 for design considerations)

The NES TECHNIFLATE® development approach uses a mixture of fundamental engineering disciplines...



RELEVANT MARKETS/APPLICATIONS

NES TECHNIFLATE® inflatable seals can be a cost effective option for applications with variable sealing requirements; expansion allows for uneven contours of the sealing face for example. They can be easier to fit as technicians can avoid forcing two components together for a good seal. Instead, they can move the mating parts freely into place and inflate the seal.

Inflatable seal technology is applicable to many applications across diverse industries:

- Heat Exchangers
- Hose Couplings
- Access Covers
- Pumps and Valves
- Chemical Reactor Chambers
- Mechanical Seals
- Filters
- Pressure Vessels
- Autoclaves
- Cryogenic Applications
- Pipelines
- Gas Compressors
- Etc

MECHANICAL HANDLING

NES TECHNIFLATE® inflatable seals can be used to assist the physical movement of items in production processes, utilising compressed air already installed in the production environment. NES TECHNIFLATE® inflatable seals can also be used in bulk material handling — transporting material across distances from one site to another.

FOOD & DRINK PROCESSING

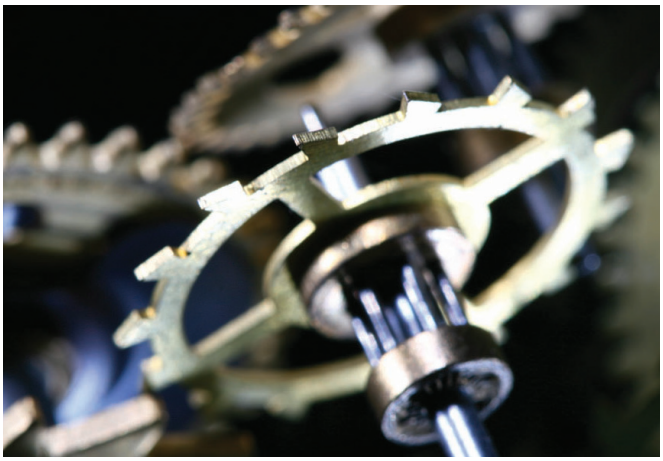
NES TECHNIFLATE® inflatable seals can be configured using FDA approved and anti-microbial materials compatible with the food industry. Designs can be compatible with stringent cleaning/hygiene regimes.

RELEVANT MARKETS/APPLICATIONS

POWER GENERATION

NES TECHNIFLATE® inflatable seals can be used in the power generation industry — from nuclear power stations to alternative energy sources such as hydro-electric, solar and wind turbines.

REGULATION, ACTUATION, CONTROL & ADJUSTMENT



NES TECHNIFLATE® inflatable seals can be used as a means of control, actuating on mechanical and electrical devises to effect a change of speed, direction or pressure.

AEROSPACE

NES TECHNIFLATE® inflatable seals can be used in the aerospace industry (for example door seals and as composite 'lay-up' tooling).

TRANSPORTATION

The transport industry (eg, rail) increasingly uses inflatable seal technology to enhance safety (closing gaps between platform and train; sliding door sealing solutions etc).

RELEVANT MARKETS/APPLICATIONS

SHAFT SEAL AND MAINTENANCE

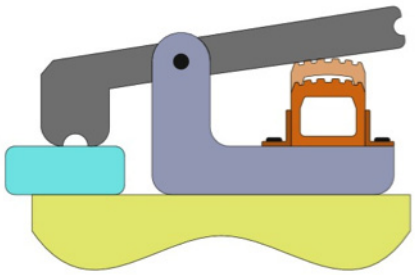
NES TECHNIFLATE® inflatable seals can provide effective temporary shaft sealing during shutdown and maintenance operations. They can be inflated against a stationary shaft while mechanical seals are being changed - thereby eliminating the need to drain mixers and agitators. This significantly reduces maintenance costs and operational down-time. The ship-building industry has obvious uses for such an application (propeller shaft change outs), as well as utilising NES TECHNIFLATE® inflatable seals to isolate storage holds from salt-laden atmospheres. NES TECHNIFLATE® 'membrane join' technology allows for wrap-around sealing and eliminates the need for shaft disconnection — thereby saving operational downtime.

STERILISATION & AUTOCLAVE OPERATIONS

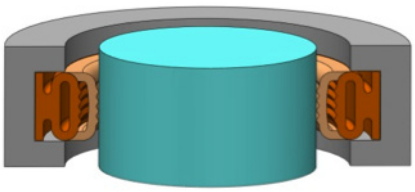
Moist heat technology is the most widely used method of sterilization. NES TECHNIFLATE® inflatable seals made out of heat and water resistant materials can provide safe sealing solutions for applications in this area.

BASIC SEAL FUNCTIONS

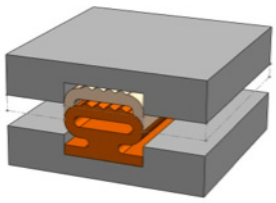
APPLICATION TO CLAMP



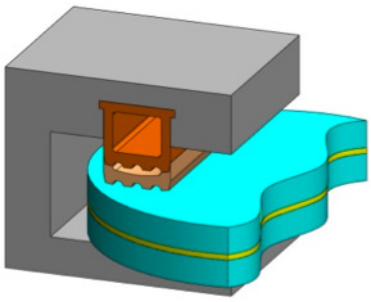
APPLICATION TO HOLD



APPLICATION TO LIFT



APPLICATION TO PRESS

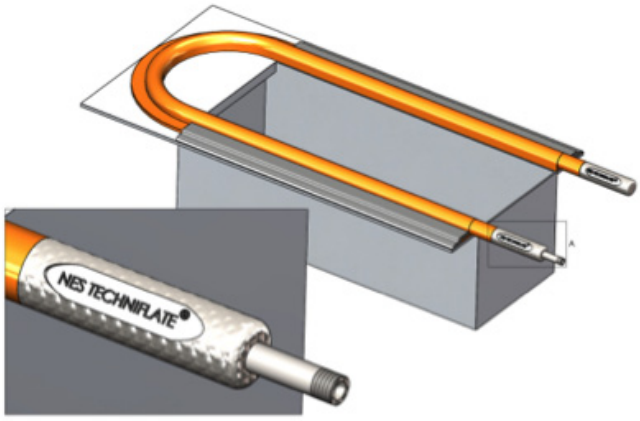


DESIGN

NES is experienced in guiding customers through the design process so that the specific qualities of the NES TECHNIFLATE® meet the specific requirements of the application.

INNOVATION

NES is highly motivated around patentable innovation in its solutions. For example, NES has designed a quick/easy-fit reusable inflation valve and end cap that customers can fit to their own cut lengths of NES TECHNIFLATE® profile. NES' specially designed NES TECHNIFLATE® 'membrane join' technology allows engineers to fit 'liquid-tight' complete wrap-round shaft seals with ease (without disconnecting the shaft) thereby minimising operational down-time.



The points below are some (not exhaustive) of the considerations during the design and selection phase that might enhance the performance of the NES TECHNIFLATE®:

- A basic description of the application: is application new or existing (if existing, details of any problems seen historically)
- Description of the environment: external pressures, operating temperatures, radiation, abrasion, UV light, microwaves, ozone etc
- Housing dimensions
- Travel set point: is the seal gap fixed or can it be reduced?
- Alignment configuration: radial-in, radial-out, axial
- Profile shape: standard or non-standard (if standard, it is unlikely to carry a tooling charge)
- Maximum supported internal seal pressure
- Profile measurements: I/D, O/D, CSD
- Valve type
- Valve orientation
- Inflation cycle details: time spent fully inflated and deflated, cycles per day/month/year
- Material requirement: FDA/USP/metal detectable/colour matching requirements
- What should be the mechanism for inflation – air, liquid?
- Any other relevant information, like required seal life

MATERIAL SELECTION

Materials	Natural rubber	Butyl	EPDM	Neoprene	NBR	Silicone	FKM	F-Silicone
FDA	NO	NO	YES	NO	YES	YES	YES	NO
3A	NO	NO	YES	NO	NO	YES	YES	NO
USP	NO	NO	YES	NO	NO	YES	YES	NO
Metal Detectable	NO	NO	YES	NO	YES	YES	YES	NO
Low outgassing	NO	NO	NO	NO	NO	NO	YES	NO
Specific gravity	0.93	0.92	1.1	1.23	1.01	0.98-1.60	1.99	1.7
Hardness range (shore A)	60-90	60-90	60-90	60-90	50-95	45-85	55-90	60-80
Tensile Strength Max	4000	2500	3000	3000	3000	1500	3000	1250
Elongation Max	750	700	600	600	600	800	450	500
Modulus	6.77	6.77	6.77	6.77	6.77	6.77	6.77	6.77
Radiation Resistance	F	E	E	G	G	F	E	E
Resiliance	E	P-F	G	G-E	F-G	F-G	F	G-E
Compression set	G	P-F	G	F-G	G	G-E	G-E	E
Impermeability to gases	F	E	F	F-G	G	P-F	G-E	E
Flex Cracking resistance	F	G	G	G-E	F	F-E	G	F-E
Tear Strength	E	G	F-G	F-G	F-G	P-F	F	P
Abrasion resistance	E	G	G-E	G-E	G-E	P-F	F-G	F
Oxidisation resistance	F-G	E	G-E	G-E	F-G	E	E	E
Ozone resistance	P	G-E	E	G-E	P	E	E	E
Weathering resistance	F	E	E	G-E	F-G	E	E	E
Sunlight resistance	P-F	E	E	G-E	P-F	E	E	E
Water resistance	E	E	E	G	G-E	G-E	G-E	G-E
Heat resistance	P	G	G-E	F-G	G	E	E	E
Low temperature flexibility	G-E	F-G	G-E	F	F-G	E	F-G	E
Oil & Gasoline	P	P-F	P	F-G	G-E	P-F	E	G
Animal & vegetable Oils	F	G-E	G	G	G-E	F-G	E	E
Alcohols	G	G	F-G	G-E	F-G	G-E	F-E	G
Alkalis	F	E	G-E	E	G-E	P-F	F-G	G
Acids	F-G	G-E	G	G	G	F	G	G
Aliphatic Hydrocarbon Solvents	P	P-F	P	G	E	P-F	E	G
Aromatic Hydrocarbon Solvents	P	P-F	P	P-F	F-G	P-F	E	E
Oxygenated Solvents	G	G-E	G-E	P-F	P	F	P	E

E = Excellent G = Good F = Fair P = Poor

MATERIAL SELECTION

TYPICAL COMPOUNDS

EPDM	Excellent resistance to hot & cold water, steam, alcohols, Ozone, Temp range -30°C (-22°F) to +120°C (248°F)
Silicone (VMQ)	Excellent resistance to heat, cold, good steam resistance. Does not age -60°C (-76°F) to +230°C (446°F)
Flourosilicone (FVMQ)	Excellent resistance to heat, cold, good steam resistance. Does not age, good resistance to chlorinated solvents -65°C (-85°F) to +180°C (356°F)
FKM (Viton™ - FPM)	Excellent upper temperature resistance, good resistance to chlorinated solvents - 20°C (-4°F) to 204°C (400°F)
Butyl (IIR)	Good resistance to keytones, diluted acids and bases, very low permeability - Temp range 20°C (4°F) to 120°C (248°F)
Neoprene (CR)	Good resistance to water, low resistance to grease, Ozone, demineralised water, air, diluted acids and bases, ketones, abrasion resistance, ultra violet rays - Temp range -20°C (-4°F) to +120°C (248°F)
Natural (NR)	Good resistance to tearing, abrasion, good flexibility at low temperatures - Temp range -40°C (-40°F) to +70°C (158°F)

NES can advise further on material selection, for example on anti-microbial materials, platinum-cured, anti-static, electrically conductive, FFKM etc.

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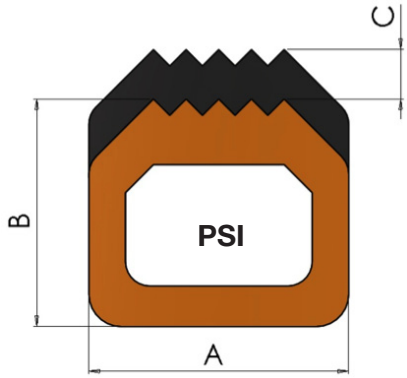
NES TECHNIFLATE®
Standard Seals

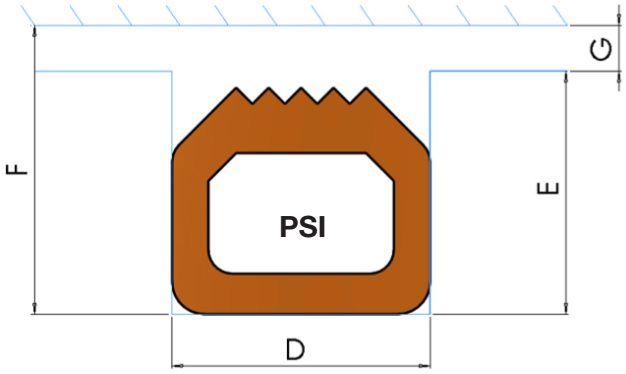
NES TECHNIFLATE®

NES STANDARD HIGH PRESSURE SEALS (CORRUGATED)

CORRUGATED SEAL DIMENSIONS



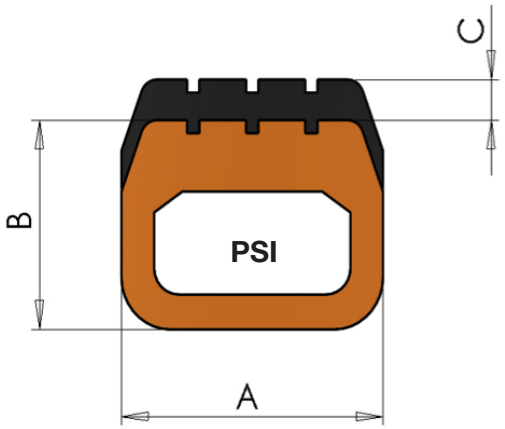
HOUSING DIMENSIONS



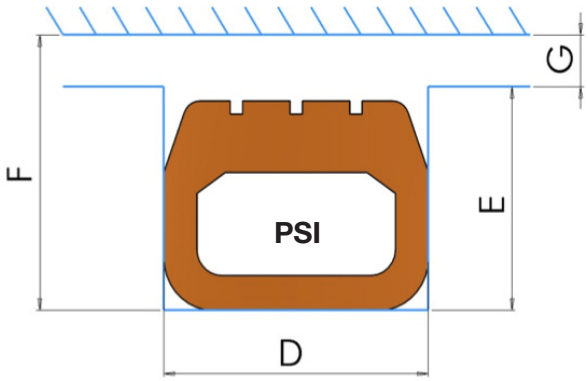
NES STANDARD HIGH PRESSURE SEALS (CORRUGATED)											
SEAL DIMENSIONS				HOUSING DETAILS				SEAL PARAMETERS			
PART No.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	MAX. PRESSURE psi/(bar)	MIN. BEND RADIAL IN	MIN. BEND RADIAL OUT	MIN. BEND AXIAL
NES 5521	6.50	5.00	1.50	6.50	5.50	6.50	1.50	14.50 (1)	20.00mm	20.00mm	15.00mm
NES 5785	14.00	10.00	3.00	14.00	11.00	13.00	2.50	58.00 (4)	35.00mm	35.00mm	30.00mm
NES 5071	16.00	14.00	3.50	16.00	15.50	17.50	2.50	72.50 (5)	40.00mm	40.00mm	35.00mm
NES 5069	20.00	20.00	4.00	20.00	21.50	24.00	3.00	87.00 (6)	60.00mm	55.00mm	80.00mm
NES 6560	21.00	24.00	5.00	21.00	26.00	29.00	3.50	101.50 (7)	70.00mm	55.00mm	80.00mm
NES 7629	54.00	40.00	8.00	54.00	42.00	48.00	6.50	145.00 (10)	150.00mm	120.00mm	85.00mm

NES STANDARD HIGH PRESSURE SEALS (GROOVED)

GROOVED SEAL DIMENSIONS

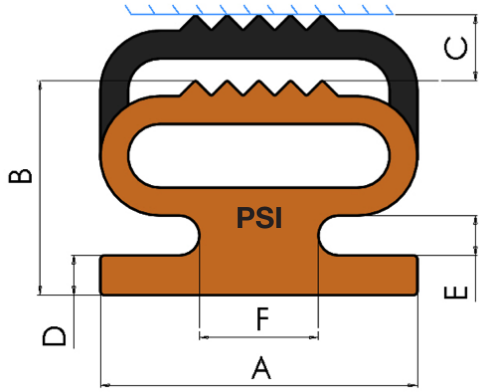


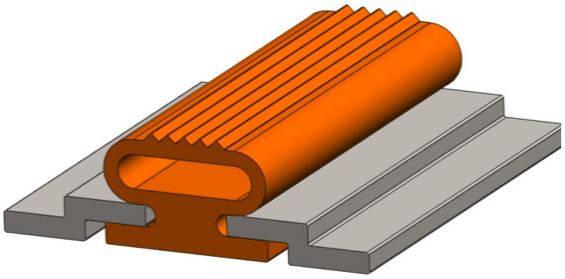
HOUSING DIMENSIONS



NES STANDARD HIGH PRESSURE SEALS (GROOVED)											
SEAL DIMENSIONS				HOUSING DETAILS				SEAL PARAMETERS			
PART No.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	MAX. PRESSURE psi/(bar)	MIN. BEND		
									RADIAL IN	RADIAL OUT	AXIAL
NES 5073	16.00	12.00	3.00	16.00	13.00	15.00	2.50	58.00 (4)	40.00mm	40.00mm	35.00mm
NES 5076	16.00	18.00	3.50	16.00	19.50	21.50	2.50	58.00 (4)	65.00mm	55.00mm	35.00mm
NES 5074	22.00	19.00	3.50	22.00	20.50	22.50	2.50	87.00 (6)	45.00mm	40.00mm	50.00mm
NES 5517	26.00	19.00	4.50	26.00	20.50	23.50	3.50	87.00 (6)	65.00mm	60.00mm	50.00mm
NES 7628	27.00	21.00	5.00	27.00	23.00	26.00	3.50	87.00 (6)	85.00mm	65.00mm	50.00mm
NES 5070	35.00	26.00	8.00	35.00	29.00	34.00	5.50	116.00 (8)	75.00mm	70.00mm	70.00mm
NES 5033	35.00	32.00	13.00	35.00	35.00	45.00	10.50	116.00 (8)	85.00mm	75.00mm	70.00mm

LOW PRESSURE (LP) SEAL DIMENSIONS

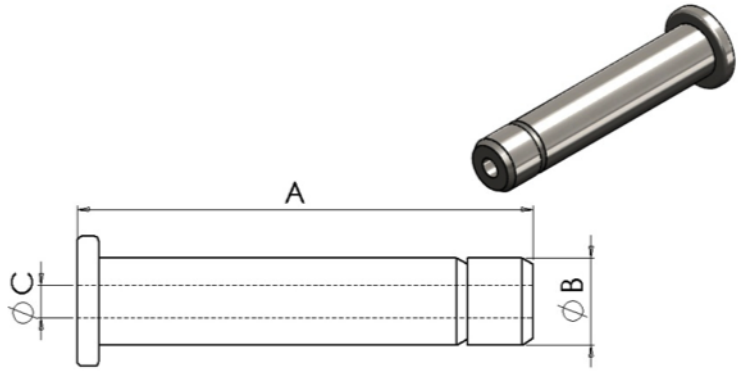




SECURED AT ALL TIMES

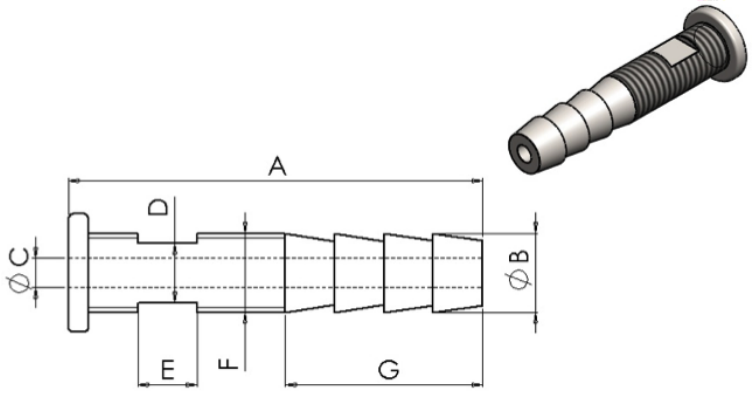
NES STANDARD LOW PRESSURE SEALS (LP)													
	SEAL DIMENSIONS						HOUSING DETAILS			SEAL PARAMETERS			
PART No.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	MAX. PRES-SURE psi/(bar)	MIN. BEND RADIAL IN (mm)	MIN. BEND RADIAL OUT (mm)	MIN. BEND AXIAL (mm)
NES 5075	30.00	20.00	25.00	4.00	4.00	12.00	30.00	22.00	30.00	43.50 (3)	80.00	70.00	100.00
NES 4634	40.00	27.00	35.00	51.00	5.00	15.00	40.00	29.00	40.00	43.50 (3)	90.00	80.00	120.00
NES 7630	60.00	35.00	50.00	6.00	6.00	25.00	60.00	38.00	60.00	43.50 (3)	105.00	90.00	170.00

STANDARD PUSH FIT VALVES (STAINLESS STEEL)



NES No.	A	ØB	ØC
NES 7650	15	4.0	1.5
NES 7651	25	4.0	1.5
NES 7652	40	4.0	1.5
NES 7653	20	6.0	3.4
NES 7654	35	6.0	3.4
NES 7655	50	6.0	3.4
NES 7656	25	8.0	3.4
NES 7657	40	8.0	3.4
NES 7658	50	8.0	3.4
NES 7659	30	10.0	5.0
NES 7660	45	10.0	5.0
NES 7661	60	10.0	5.0
NES 7662	40	12.0	6.8
NES 7663	50	12.0	6.8
NES 7715	60	12.0	6.8
NES 7716	40	14.0	6.8
NES 7717	60	14.0	6.8
NES 7718	80	14.0	6.8
NES 7719	50	16.0	8.5
NES 7720	70	16.0	8.5
NES 7721	90	16.0	8.5

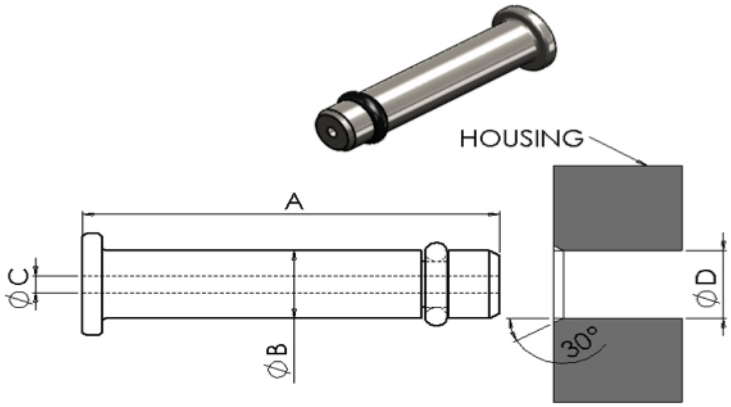
STANDARD HOSE BARB VALVES WITH WRENCH FLAT (STAINLESS STEEL)



NES No.	A	ØB	ØC	D x E	F	G
NES 7664	30	4.0	1.5	5.0 6.0	M6	12.0
NES 7665	35	4.0	1.5	5.0 6.0	M6	12.0
NES 7666	40	4.0	1.5	5.0 6.0	M6	12.0
NES 7667	50	4.0	1.5	5.0 6.0	M6	12.0
NES 7668	30	6.0	3.0	6.0 6.0	M8	16.0
NES 7669	35	6.0	3.0	6.0 6.0	M8	16.0
NES 7670	40	6.0	3.0	6.0 6.0	M8	16.0
NES 7671	50	6.0	3.0	6.0 6.0	M8	16.0
NES 7672	60	6.0	3.0	6.0 6.0	M8	16.0
NES 7673	40	8.0	5.0	8.0 8.0	M10	16.0
NES 7721	45	8.0	5.0	8.0 8.0	M10	16.0
NES 7722	50	8.0	5.0	8.0 8.0	M10	16.0
NES 7723	60	8.0	5.0	8.0 8.0	M10	16.0
NES 7724	70	8.0	5.0	8.0 8.0	M10	16.0
NES 7725	80	8.0	5.0	8.0 8.0	M10	16.0
NES 7726	40	10.0	6.0	10.0 8.0	M12	20.0
NES 7727	50	10.0	6.0	10.0 8.0	M12	20.0
NES 7728	60	10.0	6.0	10.0 8.0	M12	20.0
NES 7729	70	10.0	6.0	10.0 8.0	M12	20.0
NES 7730	80	10.0	6.0	10.0 8.0	M12	20.0
NES 7731	90	10.0	6.0	10.0 8.0	M12	20.0
NES 7732	50	12.0	6.0	11.0 8.0	M14	20.0
NES 7733	60	12.0	6.0	11.0 8.0	M14	20.0
NES 7734	70	12.0	6.0	11.0 8.0	M14	20.0
NES 7735	80	12.0	6.0	11.0 8.0	M14	20.0
NES 7736	90	12.0	6.0	11.0 8.0	M14	20.0
NES 7737	100	12.0	6.0	11.0 8.0	M14	20.0

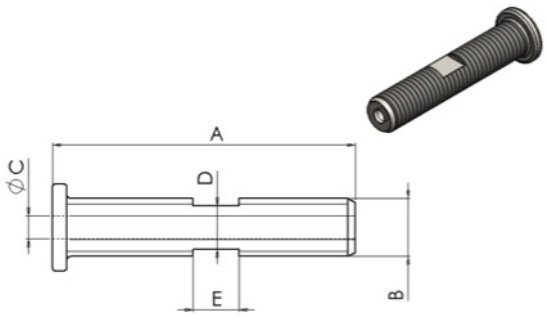
Please Note: D x E = Wrench Flat Dimensions

STANDARD HOUSING VALVES (STAINLESS STEEL)



NES No.	A	ØB	ØC	ØD
NES 7680	15	4.0	1.0	4H8
NES 7681	25	4.0	1.0	4H8
NES 7682	35	4.0	1.0	4H8
NES 7683	20	6.0	1.5	6H8
NES 7684	30	6.0	1.5	6H8
NES 7685	40	6.0	1.5	6H8
NES 7686	20	8.0	2.0	8H8
NES 7687	30	8.0	2.0	8H8
NES 7688	40	8.0	2.0	8H8
NES 7689	50	8.0	2.0	8H8
NES 7690	30	10.0	4.0	10H8
NES 7739	40	10.0	4.0	10H8
NES 7740	50	10.0	4.0	10H8
NES 7741	60	10.0	4.0	10H8
NES 7742	40	12.0	5.0	12H8
NES 7743	50	12.0	5.0	12H8
NES 7744	60	12.0	5.0	12H8
NES 7745	70	12.0	5.0	12H8
NES 7746	50	14.0	6.8	14H8
NES 7747	60	14.0	6.8	14H8
NES 7748	70	14.0	6.8	14H8
NES 7749	80	14.0	6.8	14H8

STANDARD THREADED VALVES WITH WRENCH FLAT (STAINLESS STEEL)



NES No.	A	B	ØC	D x E
NES 7691	15	M4	1.2	3.0 4.0
NES 7692	25	M4	1.2	3.0 4.0
NES 7693	35	M4	1.2	3.0 4.0
NES 7694	50	M4	1.2	3.0 4.0
NES 7695	20	M6	3.0	5.0 6.0
NES 7696	30	M6	3.0	5.0 6.0
NES 7697	40	M6	3.0	5.0 6.0
NES 7698	50	M6	3.0	5.0 6.0
NES 7699	20	M8	3.0	6.0 8.0
NES 7700	30	M8	3.0	6.0 8.0
NES 7701	40	M8	3.0	6.0 8.0
NES 7702	50	M8	3.0	6.0 8.0
NES 7703	60	M8	3.0	6.0 8.0
NES 7704	30	1/8G (BSP)	5.0	8.0 8.0
NES 7705	40	1/8G (BSP)	5.0	8.0 8.0
NES 7706	50	1/8G (BSP)	5.0	8.0 8.0
NES 7707	60	1/8G (BSP)	5.0	8.0 8.0
NES 7708	70	1/8G (BSP)	5.0	8.0 8.0
NES 7709	30	M10	5.0	8.0 8.0
NES 7754	40	M10	5.0	8.0 8.0
NES 7755	50	M10	5.0	8.0 8.0
NES 7756	60	M10	5.0	8.0 8.0
NES 7757	70	M10	5.0	8.0 8.0

(Table continues on next page)

STANDARD THREADED VALVES WITH WRENCH FLAT (STAINLESS STEEL)

(Table continued from previous page)

NES No.	A	B	ØC	D x E
NES 7758	30	M12	6.0	10.0 8.0
NES 7759	40	M12	6.0	10.0 8.0
NES 7760	50	M12	6.0	10.0 8.0
NES 7761	60	M12	6.0	10.0 8.0
NES 7762	70	M12	6.0	10.0 8.0
NES 7763	30	1/4G (BSP)	6.0	10.0 8.0
NES 7764	40	1/4G (BSP)	6.0	10.0 8.0
NES 7765	50	1/4G (BSP)	6.0	10.0 8.0
NES 7766	60	1/4G (BSP)	6.0	10.0 8.0
NES 7767	70	1/4G (BSP)	6.0	10.0 8.0
NES 7768	30	M14	6.0	11.0 8.0
NES 7769	40	M14	6.0	11.0 8.0
NES 7770	50	M14	6.0	11.0 8.0
NES 7771	60	M14	6.0	11.0 8.0
NES 7772	70	M14	6.0	11.0 8.0
NES 7773	80	M14	6.0	11.0 8.0
NES 7774	50	M16	8.0	13.0 10.0
NES 7775	60	M16	8.0	13.0 10.0
NES 7776	70	M16	8.0	13.0 10.0
NES 7777	80	M16	8.0	13.0 10.0
NES 7778	90	M16	8.0	13.0 10.0
NES 7779	100	M16	8.0	13.0 10.0

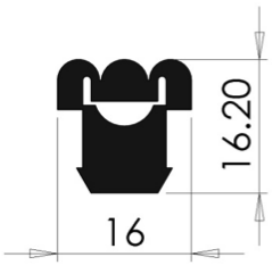
Please Note: D x E = Wrench Flat Dimensions

NES TECHNIFLATE®
Non-Standard Seals

NES TECHNIFLATE®

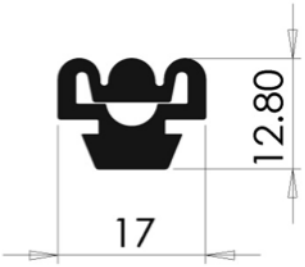
A SELECTION OF NES NON-STANDARD PROFILES

NES 4352



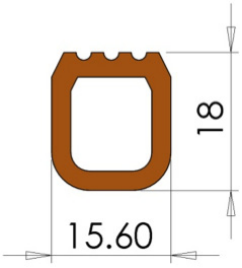
MIN BEND RATIO:
AXIAL - R40
RADIAL IN - R40
RADIAL OUT - R40
TRAVEL: - 6.00mm
MATERIAL: - FKM 60 (Black) MC 287

NES 4458



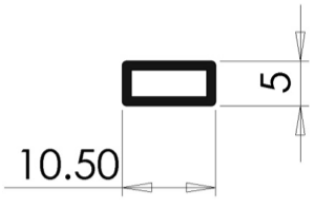
MIN BEND RATIO:
AXIAL - R40
RADIAL IN - R25
RADIAL OUT - R25
TRAVEL: - 6.00mm
MATERIAL: - FKM 60 (Black) MC 287

NES 4792



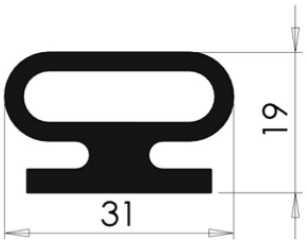
MIN BEND RATIO:
AXIAL - R40
RADIAL IN - R40
RADIAL OUT - R40
TRAVEL: - 2.50mm
MATERIAL: - SIL 60 (Red) MC 368, SIL 60 (White) MC374

NES 4902



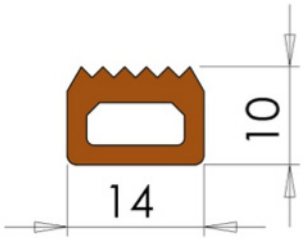
MIN BEND RATIO:
AXIAL - R50
RADIAL IN - R25
RADIAL OUT - R25
TRAVEL: - 2.00mm
MATERIAL: - EPDM 75 (BLACK) MC 130

NES 5825



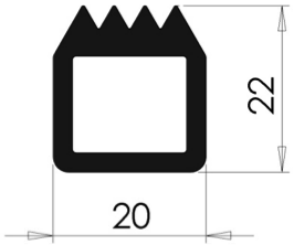
MIN BEND RATIO:
AXIAL - R100
RADIAL IN - R50
RADIAL OUT - R50
TRAVEL: - 5.00mm
MATERIAL: - EPDM 60 (BLACK) MC 389

NES 5785



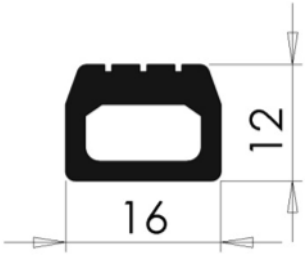
MIN BEND RATIO:
AXIAL - R30
RADIAL IN - R35
RADIAL OUT - R35
TRAVEL: - 2.50mm
MATERIAL: - SIL 60 (RED) MC 368, ALSO SIL 60 (WHITE) MC374

NES 4961



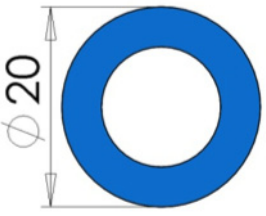
MIN BEND RATIO:
AXIAL - R40
RADIAL IN - R40
RADIAL OUT - R40
TRAVEL: - 3.50mm
MATERIAL: - FKM 75 (BLACK) MC 172

NES 5638



MIN BEND RATIO:
AXIAL - R50
RADIAL IN - R25
RADIAL OUT - R25
TRAVEL: - 3.00mm
MATERIAL: - EPDM 70 FDA USP (BLACK) MC 309

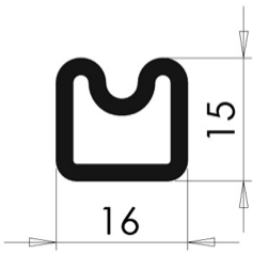
NES 5251



MIN BEND RATIO:
AXIAL - R40
RADIAL IN - R40
RADIAL OUT - R40
TRAVEL: - 2.50mm
MATERIAL: - EPDM 65 FDA (BLUE) MC 369

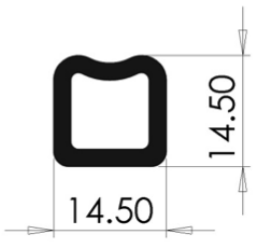
A SELECTION OF NES NON-STANDARD PROFILES

NES 5185



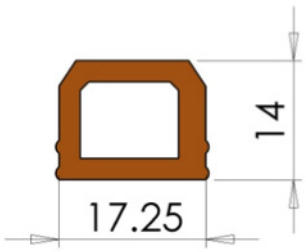
MIN BEND RATIO:
AXIAL - R50
RADIAL IN - R35
RADIAL OUT - R35
TRAVEL: - 7.00mm
MATERIAL: - EPDM USP (BLACK) FDA 70 MC 309

NES 6710



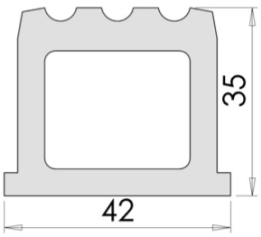
MIN BEND RATIO:
AXIAL - R40
RADIAL IN - R40
RADIAL OUT - R40
TRAVEL: - 3.00mm
MATERIAL: - EPDM 60 MC389

NES 6244



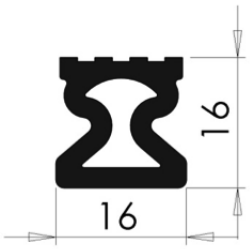
MIN BEND RATIO:
AXIAL - R50
RADIAL IN - R40
RADIAL OUT - R40
TRAVEL: - 3.00mm
MATERIAL: - SIL 60 (RED) MC 368, ALSO SIL 60 (WHITE) MC374

NES 4966



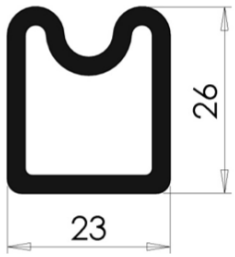
MIN BEND RATIO:
AXIAL - R75
RADIAL IN - R70
RADIAL OUT - R50
TRAVEL: - 10.00mm
MATERIAL: - SIL 60 (WHITE) MC 374 , ALSO SIL 60 (RED) MC368

NES 5909



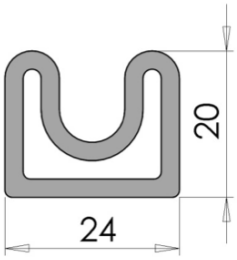
MIN BEND RATIO:
AXIAL - R50
RADIAL IN - R60
RADIAL OUT - R50
TRAVEL: - 4.00mm
MATERIAL: - EPDM 60 (BLACK) MC 389

NES 7597



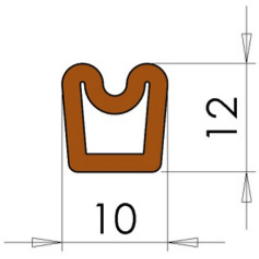
MIN BEND RATIO:
AXIAL - R100
RADIAL IN - R75
RADIAL OUT - R75
TRAVEL: - 6.00mm
MATERIAL: - EPDM 60 (BLACK) MC389

NES 7627



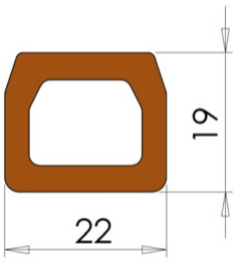
MIN BEND RATIO:
AXIAL - R100
RADIAL IN - R100
RADIAL OUT - R100
TRAVEL: - 15.00mm
MATERIAL: - SIL 60 (LIGHT GREY) MC 420

NES 5943



MIN BEND RATIO:
AXIAL - R40
RADIAL IN - R40
RADIAL OUT - R40
TRAVEL: - 5.00mm
MATERIAL: - SIL 60 (RED) MC 368, ALSO SIL 60 (WHITE) MC374

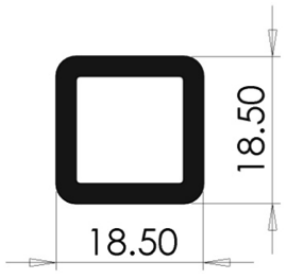
NES 5319



MIN BEND RATIO:
AXIAL - R60
RADIAL IN - R40
RADIAL OUT - R40
TRAVEL: - 3.50mm
MATERIAL: - SIL 60 (RED) MC 368, ALSO SIL 60 (WHITE) MC374

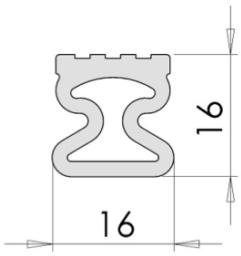
A SELECTION OF NES NON-STANDARD PROFILES

NES 7020



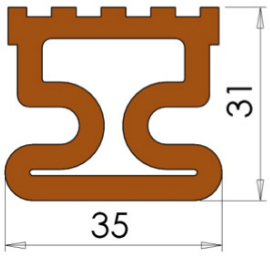
MIN BEND RATIO:
AXIAL - R50
RADIAL IN - R50
RADIAL OUT - R50
TRAVEL: - 1.50mm
MATERIAL: - EPDM 60 (BLACK) MC389

NES 6757



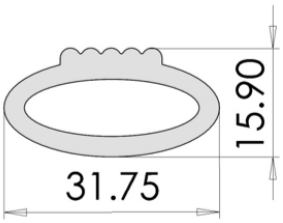
MIN BEND RATIO:
AXIAL - R50
RADIAL IN - R50
RADIAL OUT - R50
TRAVEL: - 4.00mm
MATERIAL: - SIL 60 (WHITE) MC 374, ALSO SIL 60 (RED) MC368

NES 5669



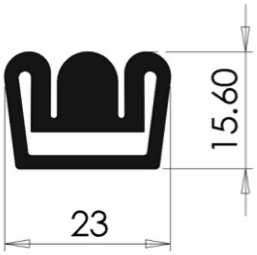
MIN BEND RATIO:
AXIAL - R100
RADIAL IN - R100
RADIAL OUT - R100
TRAVEL: - 16.00mm
MATERIAL: - SIL 60 (RED) MC368, ALSO SIL 60 (WHITE) MC374

NES 6258



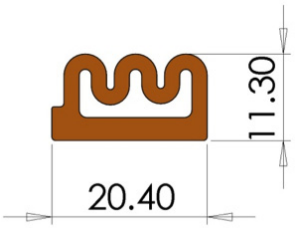
MIN BEND RATIO:
AXIAL - R150
RADIAL IN - R50
RADIAL OUT - R50
TRAVEL: - 3.00mm
MATERIAL: - SIL 60 (WHITE) MC 374, ALSO SIL 60 (RED) MC368

NES 4459



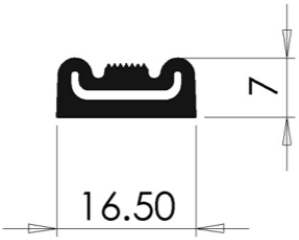
MIN BEND RATIO:
AXIAL - R50
RADIAL IN - R50
RADIAL OUT - R50
TRAVEL: - 15.00mm
MATERIAL: - FKM 60 (BLACK) MC 287

NES 4865



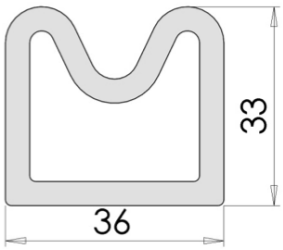
MIN BEND RATIO:
AXIAL - R75
RADIAL IN - R25
RADIAL OUT - R25
TRAVEL: - 6.00mm
MATERIAL: - SIL 60 (RED) MC 368, ALSO SIL 60 (WHITE) MC374

NES 4835



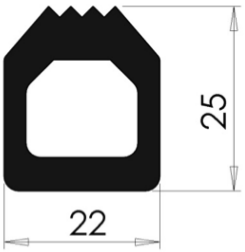
MIN BEND RATIO:
AXIAL - R50
RADIAL IN - R20
RADIAL OUT - R20
TRAVEL: - 5.00mm
MATERIAL: - FKM 60 (BLACK) MC 287

NES 5062



MIN BEND RATIO:
AXIAL - R100
RADIAL IN - R75
RADIAL OUT - R75
TRAVEL: - 15.00mm
MATERIAL: - SIL 60 (WHITE) MC 374, ALSO SIL 60 (RED) MC368

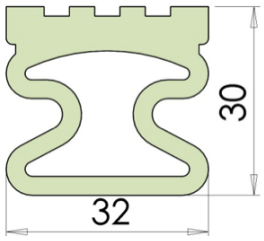
NES 5245



MIN BEND RATIO:
AXIAL - R50
RADIAL IN - R50
RADIAL OUT - R50
TRAVEL: - 3.50mm
MATERIAL: - EPDM 60 (BLACK) MC 278
ALSO EPDM FDA 60 MC 281

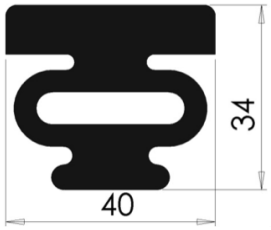
A SELECTION OF NES NON-STANDARD PROFILES

NES 5528



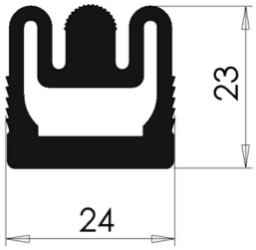
MIN BEND RATIO:
AXIAL - R100
RADIAL IN - R100
RADIAL OUT - R100
TRAVEL: - 16.00mm
MATERIAL: - SIL70FDA USP TRANSMC308

NES 5544



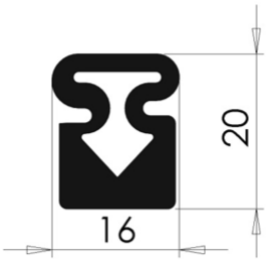
MIN BEND RATIO:
AXIAL - R100
RADIAL IN - R100
RADIAL OUT - R100
TRAVEL: - 10.00mm
MATERIAL: - EPDM 60 (BLACK) MC 389

NES 6031



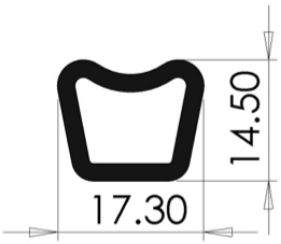
MIN BEND RATIO:
AXIAL - R125
RADIAL IN - R100
RADIAL OUT - R100
TRAVEL: - 17.00mm
MATERIAL: - EPDM 60 (BLACK) MC 389

NES 5633



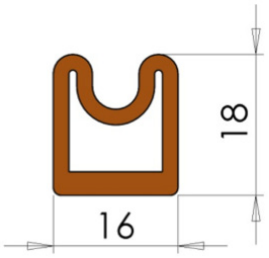
MIN BEND RATIO:
AXIAL - R75
RADIAL IN - R50
RADIAL OUT - R50
TRAVEL: - 8.00mm
MATERIAL: - EPDM 65 (BLACK) MC 389

NES 5634



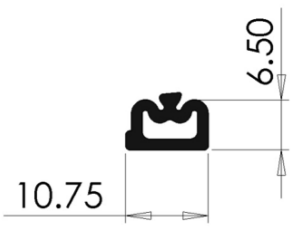
MIN BEND RATIO:
AXIAL - R60
RADIAL IN - R50
RADIAL OUT - R50
TRAVEL: - N/A
MATERIAL: - EPDM 65 (BLACK) MC 389

NES 5945



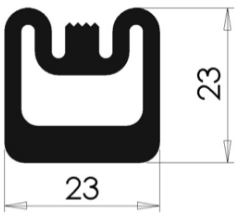
MIN BEND RATIO:
AXIAL - R75
RADIAL IN - R75
RADIAL OUT - R75
TRAVEL: - 6.00mm
MATERIAL: - SIL 60 (RED) MC 368, ALSO SIL 60 (WHITE) MC374

NES 7427



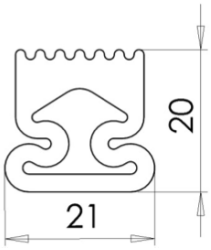
MIN BEND RATIO:
AXIAL - R75
RADIAL IN - R50
RADIAL OUT - R50
TRAVEL: - 3.50mm
MATERIAL: - FKM 60 (BLACK) MC287

NES 5975



MIN BEND RATIO:
AXIAL - R80
RADIAL IN - R60
RADIAL OUT - R75
TRAVEL: - 15.00mm
MATERIAL: - EPDM 65 FDA (BLACK) MC 281

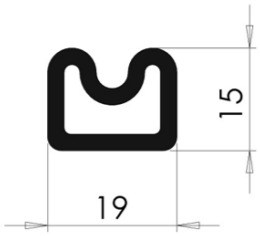
NES 5931



MIN BEND RATIO:
AXIAL - R75
RADIAL IN - R75
RADIAL OUT - R75
TRAVEL: - 8.00mm
MATERIAL: - SIL 60 (WHITE) MC 374 , ALSO SIL 60 (RED) MC368. (NO TOOLING)

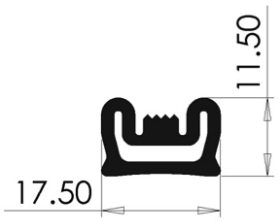
A SELECTION OF NES NON-STANDARD PROFILES

NES 6118



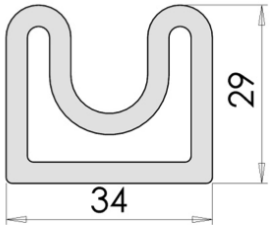
MIN BEND RATIO:
AXIAL - R75
RADIAL IN - R60
RADIAL OUT - R60
TRAVEL: - 7.00mm
MATERIAL: - EPDM 60 (BLACK) MC 389

NES 6983



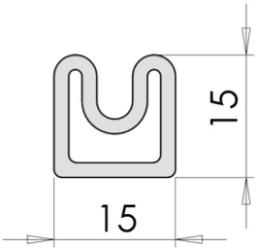
MIN BEND RATIO:
AXIAL - R75
RADIAL IN - R50
RADIAL OUT - R50
TRAVEL: - 6.00mm
MATERIAL: - EPDM 60 (BLACK) MC 389

NES 7230



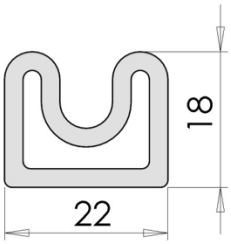
MIN BEND RATIO:
AXIAL - R150
RADIAL IN - R100
RADIAL OUT - R100
TRAVEL: - 15.00mm
MATERIAL: - SIL 60 (WHITE)MC 374, ALSO SIL 60 (RED) MC368

NES 7232



MIN BEND RATIO:
AXIAL - R60
RADIAL IN - R50
RADIAL OUT - R50
TRAVEL: - 7.00mm
MATERIAL: - SIL 60 (WHITE) MC 374, ALSO SIL 60 (RED) MC368

NES 7231

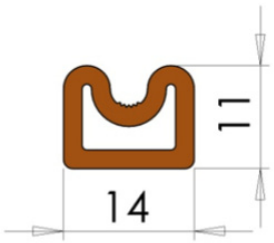


MIN BEND RATIO:
AXIAL - R75
RADIAL IN - R75
RADIAL OUT - R75
TRAVEL: - 10.00mm
MATERIAL: - SIL 60 (WHITE) MC389, ALSO SIL 60 (RED) MC368

NES 7344

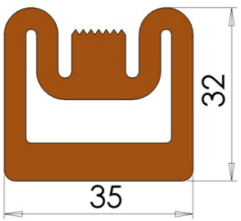
MIN BEND RATIO:
AXIAL - R75
RADIAL IN - R60
RADIAL OUT - R60
TRAVEL: - 2.00mm
MATERIAL: - EPDM 60 (BLACK) MC389

NES 7284



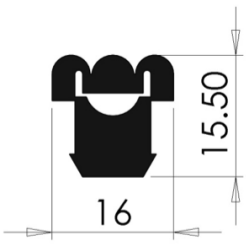
MIN BEND RATIO:
AXIAL - R40
RADIAL IN - R40
RADIAL OUT - R40
TRAVEL: - 5.00mm
MATERIAL: - SIL 60 (RED)MC 368,ALSO SIL 60 (WHITE) 374

NES 7381



MIN BEND RATIO:
AXIAL - R125
RADIAL IN - R100
RADIAL OUT - R100
TRAVEL: - 18.00mm
MATERIAL: - SIL 60 (RED) MC368 ALSO SIL 60 (WHITE) MC374

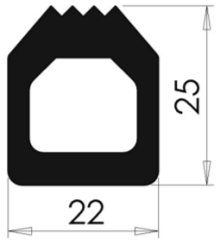
NES 6051



MIN BEND RATIO:
AXIAL - R40
RADIAL IN - R40
RADIAL OUT - R40
TRAVEL: - 6.00mm
MATERIAL: - FKM 60 (BLACK) MC 287

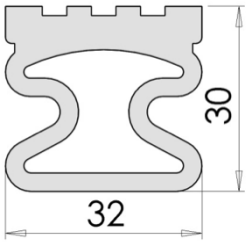
A SELECTION OF NES NON-STANDARD PROFILES

NES 7309



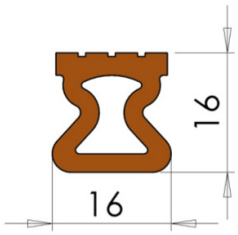
MIN BEND RATIO:
AXIAL - R75
RADIAL IN - R75
RADIAL OUT - R75
TRAVEL: - 3.00mm
MATERIAL: - EPDM 60 (BLACK) MC278

NES 7310



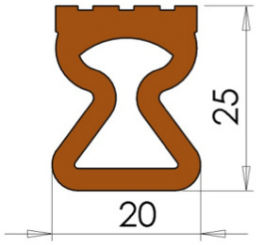
MIN BEND RATIO:
AXIAL - R100
RADIAL IN - R100
RADIAL OUT - R100
TRAVEL: - 16.00mm
MATERIAL: - SIL 60 (WHITE) MC 374

NES 5537



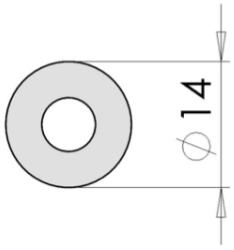
MIN BEND RATIO:
AXIAL - R60
RADIAL IN - R50
RADIAL OUT - R50
TRAVEL: - 4.00mm
MATERIAL: - SIL 60 (RED) MC368 SIL 60 (WHITE) MC374

NES 5456



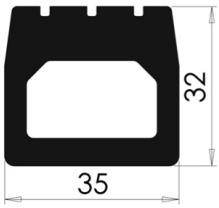
MIN BEND RATIO:
AXIAL - R50
RADIAL IN - R85
RADIAL OUT - R70
TRAVEL: - 10.00mm
MATERIAL: - SIL 60 (RED) MC 368, ALSO SIL 60 (WHITE) MC374

NES 5596



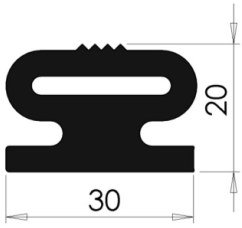
MIN BEND RATIO:
AXIAL - R20
RADIAL IN - R20
RADIAL OUT - R20
TRAVEL: - 2.00mm
MATERIAL: - SIL 60 (WHITE) MC374, ALSO SIL 60 (RED) MC368

NES 5809



MIN BEND RATIO:
AXIAL - R75
RADIAL IN - R75
RADIAL OUT - R75
TRAVEL: - 10.00mm
MATERIAL: - NBR 60MC394,EPDM FDA USP MC309

NES 6615



MIN BEND RATIO:
AXIAL - R100
RADIAL IN - R70
RADIAL OUT - R80
TRAVEL: - 5.00mm
MATERIAL: - FKM 60 (BLACK) MC 287

A SELECTION OF NES NON-STANDARD VALVES

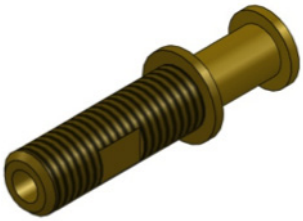
NES 5840

MATERIAL: Stainless Steel

NES 5847

MATERIAL: Brass

NES 5852



MATERIAL: Brass

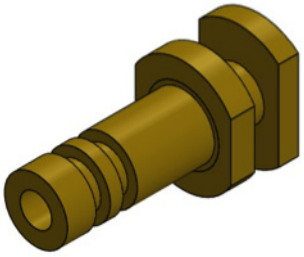
NES 5858

MATERIAL: Brass

NES 5865

MATERIAL: Stainless Steel

NES 5834

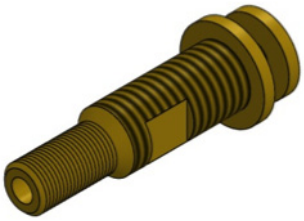


MATERIAL: Brass

NES 5845

MATERIAL: Stainless Steel

NES 5848



MATERIAL: Brass

NES 5849

MATERIAL: Stainless Steel

NES 5861

MATERIAL: Stainless Steel

NES 5901

MATERIAL: Brass

NES 6240

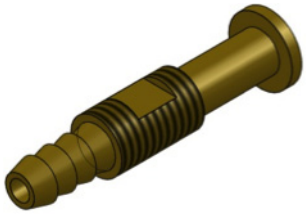
MATERIAL: Stainless Steel

A SELECTION OF NES NON-STANDARD VALVES

NES 6684

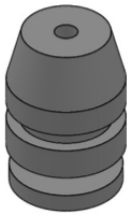
MATERIAL: Stainless Steel

NES 6966



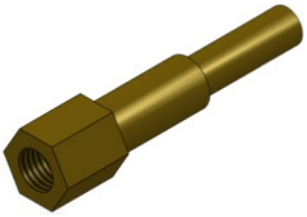
MATERIAL: Brass

NES 6982



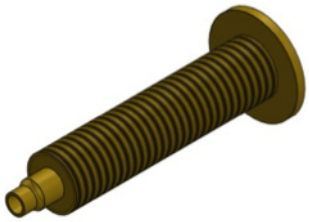
MATERIAL: Nylon

NES 7019



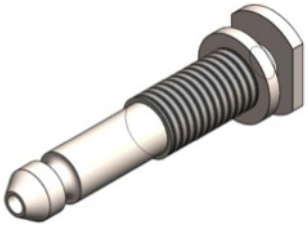
MATERIAL: Brass

NES 7144



MATERIAL: Brass

NES 7247

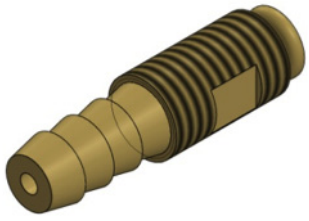


MATERIAL: Stainless Steel

NES 7255

MATERIAL: Brass

NES 7359



MATERIAL: Brass

INSTALLATION

PREPARATION OF THE NES TECHNIFLATE® CHANNEL/HOUSING

NES recommends the thorough preparation of the seal channel/housing by ensuring it is free from dirt, grease, sharp edges or anything else that might either damage the integrity of the NES TECHNIFLATE® inflatable seal, or prevent a strong adhesive bond/correct fitment. Installers should consider, therefore, the use of degreasing agents and the smoothing off of sharp edges (sandblasting prior to adhesive priming is known to significantly improve bond strength).

NES TECHNIFLATE® inflatable seals can be mechanically (screw base for example) and/or chemically (adhesive) secured to the seal channel/housing. Should adhesive be used, NES recommends applying adhesive only to the base or bottom surface of the NES TECHNIFLATE® seal.

CONTACT

For quotations, samples or further technical advice:

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Fax: +44 (0) 1909 560 184
Email: jatkins@northerneng.co.uk
Web: www.northerneng.co.uk

DISCLAIMER

NES' Terms & Conditions apply to/prevail for all purchases of the NES TECHNIFLATE® product.

Visit http://www.northerneng.co.uk/terms-conditions-sale for more information.

Due to a lack of control over fitment, NES cannot accept any liability for the performance of the NES TECHNIFLATE® seal once it is installed, neither does it accept any liability for consequential losses or personal injury due to failure of the seal after installation.

This brochure has been produced using widely available and generic technical data on inflatable seal technology. Customers of NES are strongly encouraged to take appropriate care in fully understanding the application for which they purchase the NES TECHNIFLATE® product so that they can mitigate any risk of failure/injury during the design/selection process.

NES TECHNIFLATE®

Northern
Engineering (Sheffield) Ltd

NES TECHNIFLATE®

INFLATABLE SEALS PRODUCT INFORMATION

NES TECHNIFLATE®

Northern Engineering (Sheffield) Ltd is a wholly owned subsidiary of the Sanders Industries Group, of which the following US companies are also members.

Creavey Seal Company

FABRITECH INC.

RUBBERCRAFT

Sanders Composites

Sanders Industries Si