

ASEC brochure SP spherical plain bearings

Durable, reliable and efficient

Content	
1. Introduction	3
1.1 Misalignment	3
1.2 Advantages of Spherical Plain Bearings.....	3
1.3 Economic Aspects.....	3
1.4 ASEC SP bearing	4
2. Applications.....	4
3. Standards	4
4. Tolerances	4
5. Bearing Design	5
5.1 Split (Shared) Outer Ring	6
5.2 Fixed and Loose Bearings	6
6. Lubrication	6
6.1 Lubricants	6
7. References	7
8. Dimensions ASEC SP	8
Dimensions ASEC SP	9
Dimensions ASEC SP (H)	10
Dimensions ASEC SPRS	11

1. Introduction

ASEC SP spherical plain bearings are suitable for all rotational pivot points, especially oscillatory movements, where the shaft must be self-aligning. As a result, spherical plain bearings are particularly suitable for (the eyes of) hydraulic cylinders. Cylinders are always oscillating and therefore must move freely without any lateral load pressure on the rod at any time during movement.

A lateral load causes an axial load on the guide and seals of the piston rod, which can lead to leaks. The simultaneous movement of the cylinder and the spherical sliding bearing will prevent this leakage.

1.1 Misalignment

Misalignment can occur for various reasons such as:

- Dimensional variations during the design and manufacturing process, expansion or relocation of materials in construction during its lifetime
- Manufacturing errors
- Assembly of Foreign Parts
- Changes of/in Foundations or Base

1.2 Benefits of Spherical Plain Bearings

- Insensitive to misalignment
- Simultaneous insertion of axial and radial loads
- Optimal combination of materials in sliding surfaces
- Attenuation
- Space saving
- Longer lifetime

1.3 Economic aspects

ASEC SP Spherical Plain Bearings have a favorable impact on operating costs. The spherical sliding bearing is intended for application in durable structures with a high service lifetime and in which a long time between service intervals is sought. Specifically, with these requirements ASEC SP Bearings are a reliable and price-competitive alternative which should be considered.

1.4 ASEC SP Bearing

The modular spherical plain bearing is made from different combinations of materials and complies with ISO 12240-1 (formerly DIN 648). Therefore the ASEC SP bearing is directly interchangeable with other spherical plain bearings. A unique characteristic of the ASEC SP bearing is that it can be used in a modular way.

The ASEC SP bearing is manufactured using various combinations of steel which include:

- 42CrMo4V
- AISI 316 L
- AISI 431
- INCONEL 625
- Other

The ASEC SP bearing can also be equipped with surface-curing coatings. Coating composites offered are:

- RS20
- RS30
- RS40
- CM20
- Other

The specific requirements of the application will determine the proper choice of materials. Considerations in this design process are choices between usage of coated versus uncoated steel or stainless steel implementations.

2. Applications

Our ASEC SP Bearing is used in various main rotation points of Bridges and Sluices in the Netherlands and abroad. Other applications are Hydraulic Cylinders and other machine parts in which a relatively large tilt or misalignment can occur.



3. Standards

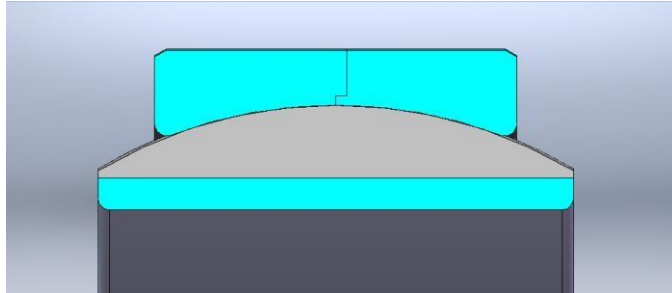
ASEC SP Bearings are manufactured in accordance with ISO standard 12240-1 (formerly DIN 648). This means that the ASEC SP Bearing is fully interchangeable with standard spherical plain bearings. The ASEC SP Bearing is approved by several institutions in the field such as "The Province of Groningen" in the Netherlands, MR Consult other institutions and agencies for usage in bridges and sluices.

4. Tolerances

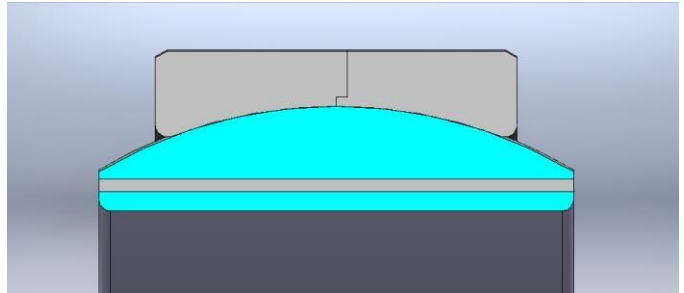
The tolerances are established in the same standard. Upon request ASEC PLASTIC B.V. can re-design, adjust, manufacture and supply ASEC SP Bearings in accordance to your custom needs.

5. Bearing Design

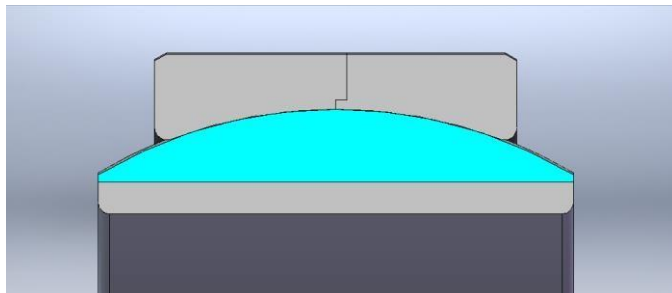
ASEC SP spherical plain bearings are supplied for mounting on shafts with a diameter of 25-1200. Above 120 mm a split (shared) outer ring is used.



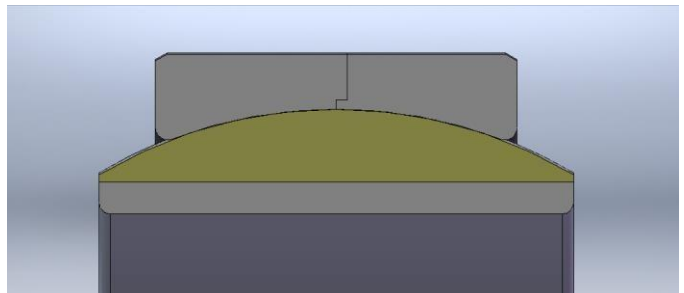
SPXR



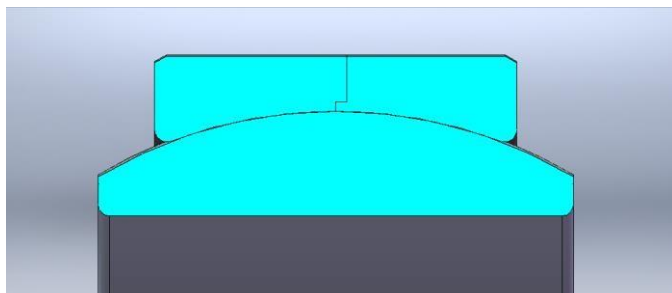
SPRSB



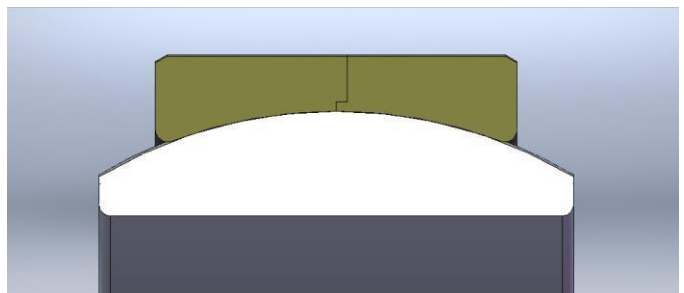
SPX



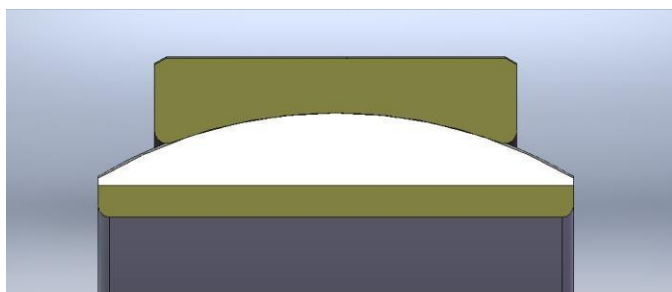
SPXCM



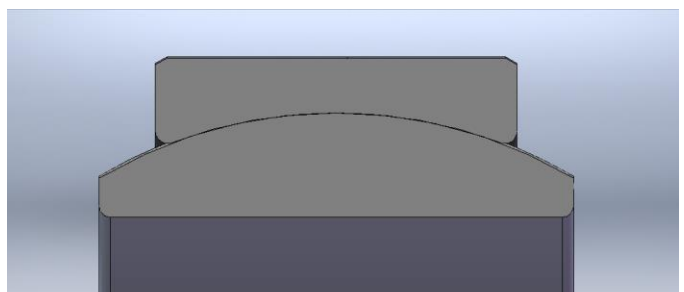
SPRS4



SPCE



SPCM



SPRS2

5.1 Split (Shared) Outer ring

The split (shared) outer ring, for ASEC SP bearing with a shaft diameter of 160 mm and up, is mounted on the ASEC SP bearing with Allen screws. It is necessary to mount the ASEC SP bearing in a such a way in order to prevent an axial radial load on the bearing. The bolts have a relatively small diameter and are (in the case of the RVS-type) made of stainless steel. It is required that the outer ring is locked in the used housing.

5.2 Fixed and loose bearings

Often a combination of a fixed and a loose bearing is used for the proper functionality of the main pivot point in bridges. The fixed bearing is on the housing as well as the shaft. The floating bearing has an inner sleeve which has a small clearance relative to the shaft. This allows the free movement of the shaft in the bearing. The shaft is hardened to control excessive wear.

Under those circumstances ASEC Plastics BV advises an composite inner sleeve for the bearing.

6. Lubrication

Lubrication always leads to a prolonged service life by reducing wear. Lubrication also reduces the access of dirt particles. In general it is important to lubricate frequently in accordance with usage. For usage of ASEC SP non-corrosive resistant steel bearings lubrication is required. Although not strictly necessary, we also recommend lubrication for our ASEC SP corrosive resistant steel bearings.

6.1 Lubricants

The ASEC SP bearing can be greased with all commercially available lubricants as long as the lubricant meets the ASEC SP bearing requirements for the bearing's operation and durability. Solvents which could damage the materials of the ASEC SP bearings should be avoided at any time. Shell Rhodina EP (LF) 2 is a heavy calcium based grease and example of a lubricant which can be used for ASEC SP bearings. Please refer to the manufacturer's specifications before using any lubricant. New lubricants for ASEC SP bearings are in development.

7. References

The ASEC SP bearing can be greased with all commercially available lubricants as long as the lubricant meets the ASEC SP bearing requirements for the bearing's operation and durability. Solvents which could damage the materials of the ASEC SP bearings should be avoided at any time. Shell Rhodina EP (LF) 2 is a heavy calcium based grease and example of a lubricant which can be used for ASEC SP bearings. Please refer to the manufacturer's specifications before using any lubricant. New lubricants for ASEC SP bearings are in development.



Drawbridge Bedum



Sluices Rogat Bridge

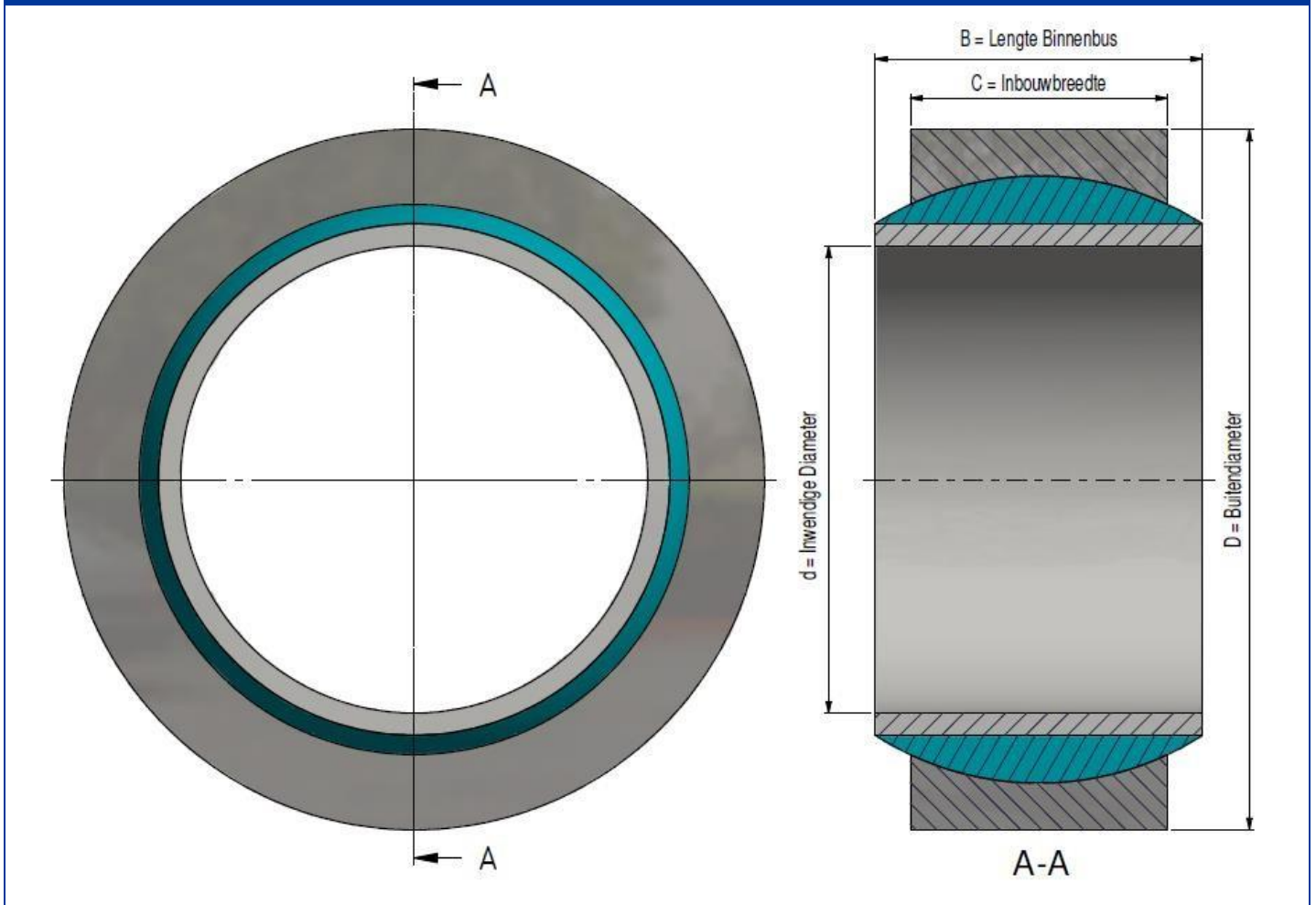


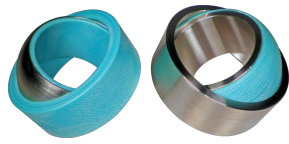
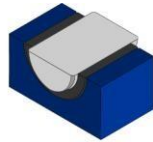
Ossesluis Luis De Wijk



Swing Bridge Roodehaan Groningen

8. Verklaring afmetingen tabellen

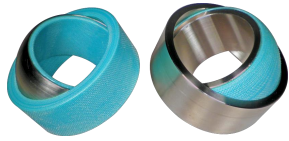
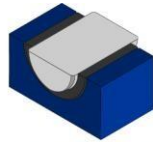




Dimensions ASEC SP (General Width)

Bearing Type	Bearing Size				Wear Numbers		Tilt Angle
	d (mm)	D (mm)	B (mm)	C (mm)	Dyn C (kN)	Stat C ₀ (kN)	α (°)
ASEC SP 10	10	19	9	7	7,2	12	8
ASEC SP 20	20	35	16	12	24,6	40	8
ASEC SP 25	25	42	20	16	45,6	74	7
ASEC SP 30	30	47	22	18	59,8	97	6
ASEC SP 35	35	55	25	20	76	124	6
ASEC SP 40	40	62	28	22	94	153	7
ASEC SP 45	45	68	32	25	115	187	7
ASEC SP 50	50	75	35	28	151	246	6
ASEC SP 60	60	90	44	36	235	382	6
ASEC SP 70	70	105	49	40	372	605	6
ASEC SP 80	80	120	55	45	387	629	6
ASEC SP 90	90	130	60	50	474	771	5
ASEC SP 100	100	150	70	55	588	955	7
ASEC SP 110	110	160	70	55	631	1025	6
ASEC SP 120	120	180	85	70	894	1453	6
ASEC SP 140	140	210	90	70	1038	1686	7
ASEC SP 160	160	230	105	80	1302	2116	8
ASEC SP 180	180	260	105	80	1441	2342	6
ASEC SP 200	200	290	130	100	2054	3338	6
ASEC SP 220	220	320	135	100	2227	3618	8
ASEC SP 240	240	340	140	100	2430	3949	8
ASEC SP 260	260	370	150	110	2920	4746	7
ASEC SP 280	280	400	155	120	3398	5522	6
ASEC SP 300	300	430	165	120	3625	5891	7
ASEC SP 320	320	440	160	135	4150	6743	4
ASEC SP 340	340	460	160	135	4469	7262	3
ASEC SP 360	360	480	160	135	4682	7608	3
ASEC SP 380	380	520	190	160	5941	9654	4
ASEC SP 400	400	540	190	160	6194	10065	3
ASEC SP 420	420	560	190	160	6446	10475	3
ASEC SP 440	440	600	218	185	8052	13085	3
ASEC SP 460	460	620	218	185	8345	13560	3
ASEC SP 480	480	650	230	194	9062	14726	3
ASEC SP 500	500	670	230	195	9428	15305	3
ASEC SP 530	530	710	243	205	10394	16890	3
ASEC SP 560	560	750	258	215	11417	18552	4
ASEC SP 600	600	800	272	230	13133	21341	3
ASEC SP 630	630	850	300	260	15686	25490	3
ASEC SP 670	670	900	308	260	16512	26832	3
ASEC SP 710	710	950	325	275	18546	30167	3
ASEC SP 750	750	1000	335	280	20016	32526	3
ASEC SP 800	800	1060	335	300	22648	36803	2
ASEC SP 850	850	1120	365	310	25133	40841	2
ASEC SP 900	900	1180	375	320	27221	44234	2
ASEC SP 950	950	1250	400	340	30825	50092	2
ASEC SP 1000	1000	1320	438	370	35328	57408	2

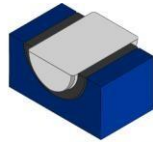
Note: Listed are the Maximum permissible bearing numbers/loads. Usage at higher higher than listed bearing number/loads only after written approval of ASEC Plastic B.V.



Dimensions ASEC SP-H (Extra Width)

Bearing Type	Bearing Size				Wear Numbers		Tilt Angle
	d (mm)	D (mm)	B (mm)	C (mm)	Dyn C (kN)	Stat C ₀ (kN)	α (°)
ASEC SP-H 100	100	150	70	55	708	1150	2
ASEC SP-H 110	110	160	70	55	853	1386	2
ASEC SP-H 120	120	180	85	80	1024	1664	2
ASEC SP-H 140	140	210	90	80	1399	2273	2
ASEC SP-H 160	160	230	105	80	1814	2984	2
ASEC SP-H 180	180	260	128	122	2284	3712	2
ASEC SP-H 200	200	290	140	134	2767	4496	2
ASEC SP-H 220	220	320	155	148	3340	5428	2
ASEC SP-H 240	240	340	170	162	3968	6448	2
ASEC SP-H 260	260	370	185	175	4678	7602	2
ASEC SP-H 280	280	400	200	190	5475	8896	2
ASEC SP-H 300	300	430	212	200	6146	9987	2
ASEC SP-H 320	320	460	230	218	7154	11625	2
ASEC SP-H 340	340	480	243	230	8026	13042	2
ASEC SP-H 360	360	520	258	243	9062	14725	2
ASEC SP-H 380	380	540	272	258	10038	16312	2
ASEC SP-H 400	400	580	280	265	10899	17710	2
ASEC SP-H 420	420	600	300	280	12143	19732	2
ASEC SP-H 440	440	630	315	300	13732	22314	2
ASEC SP-H 460	460	650	325	308	14639	23788	2
ASEC SP-H 480	480	680	340	320	15925	25879	2
ASEC SP-H 500	500	710	355	335	17476	28398	2
ASEC SP-H 530	530	750	375	355	19486	31664	2
ASEC SP-H 560	560	800	400	380	22075	35872	2
ASEC SP-H 600	600	850	425	400	24835	40357	2
ASEC SP-H 630	630	900	450	425	27749	45092	2
ASEC SP-H 670	670	950	475	450	31181	50669	2
ASEC SP-H 710	710	1000	500	475	34813	56571	2
ASEC SP-H 750	750	1060	530	500	38645	62798	2
ASEC SP-H 800	800	1120	565	530	43930	71386	2
ASEC SP-H 850	850	1220	600	565	50445	81973	2
ASEC SP-H 900	900	1250	635	600	55494	90178	2
ASEC SP-H 950	950	1360	670	635	63300	102863	2
ASEC SP-H 1000	1000	1450	710	670	71075	115497	2

Note: Listed are the Maximum permissible bearing numbers/loads. Usage at higher than listed bearing number/loads, only after written approval of ASEC Plastic B.V.



Dimensions ASEC SPRS (Whole Composite Execution)

Bearing Type	d (mm)	Bearing Size			Wear Numbers		Tilt Angle
		D	B	C	Dyn C (kN)	Stat C ₀ (kN)	α (°)
ASEC SPRS 100	100	100	150	70	147	220	2
ASEC SPRS 110	110	110	160	70	158	237	2
ASEC SPRS 120	120	120	180	85	224	335	2
ASEC SPRS 140	140	140	210	90	259	389	2
ASEC SPRS 160	160	160	230	105	325	488	2
ASEC SPRS 180	180	180	260	128	360	540	2
ASEC SPRS 200	200	200	290	140	514	770	2
ASEC SPRS 220	220	220	320	155	557	835	2
ASEC SPRS 240	240	240	340	170	608	911	2
ASEC SPRS 260	260	260	370	185	730	1095	2
ASEC SPRS 280	280	280	400	200	850	1274	2
ASEC SPRS 300	300	300	430	212	906	1359	2
ASEC SPRS 320	320	320	460	230	1037	1556	2
ASEC SPRS 340	340	340	480	243	1117	1676	2
ASEC SPRS 360	360	360	520	258	1170	1756	2
ASEC SPRS 380	380	380	540	272	1485	2228	2
ASEC SPRS 400	400	400	580	280	1548	2323	2
ASEC SPRS 420	420	420	600	300	1612	2417	2
ASEC SPRS 440	440	440	630	315	2013	3020	2
ASEC SPRS 460	460	460	650	325	2086	3129	2
ASEC SPRS 480	480	480	680	340	2266	3398	2
ASEC SPRS 500	500	500	710	355	2355	3532	2
ASEC SPRS 530	530	530	750	375	2598	3898	2
ASEC SPRS 560	560	560	800	400	2854	4281	2
ASEC SPRS 600	600	600	850	425	3283	4925	2
ASEC SPRS 630	630	630	900	450	3922	5882	2
ASEC SPRS 670	670	670	950	475	4128	6192	2
ASEC SPRS 710	710	710	1000	500	4641	6962	2
ASEC SPRS 750	750	750	1060	530	5004	7506	2
ASEC SPRS 800	800	800	1120	565	5662	8493	2
ASEC SPRS 850	850	850	1220	600	6283	9425	2
ASEC SPRS 900	900	900	1250	635	6805	10208	2
ASEC SPRS 950	950	950	1360	670	7706	11560	2
ASEC SPRS 1000	1000	1000	1450	710	8832	13248	2

Note: Listed are the Maximum permissible bearing numbers/loads. Usage at higher than listed bearing number/loads, only after written approval of ASEC Plastic B.V.