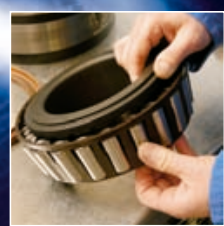




**SNR rail solutions:
The future on rails**



SNR - Industry



INDUSTRY



Since its incorporation, SNR has been rising to the challenges set by the rail industry



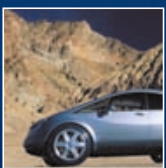
On board when the TGV® began, still there at 385km/hr

SNR, at the very heart of big European rail projects for more than 40 years. Its cutting edge technological know-how has made it the indispensable partner of the main international players in OEM and AFT. After its contribution to setting the world speed record at 515.3 km/hr on all TGV® components, SNR is now the only manufacturer approved at 385 km/hr on bench. Our position as a technological leader may be explained by the high level expertise of our R&D engineers, our comprehensive array of laboratory and test centre equipment and our dedication to State-of-the-Art technical solutions: materials, geometries, surface treatments, etc.

Client references: SNCF - ALSTOM - RATP - BOMBARDIER - TI - ARBEL - ABRF
ATELIER DE JOIGNY - LORMAFER - NOVATRANS - ERMEWA SATI - CTC - SDH - CFD

The SNR Group: from the railroad track to the highway to the stars

Although it was automotive bearings that forged SNR's reputation through the decades, these products are now proving their worth in other extremely demanding mechanical environments in the industrial and aerospace markets.



- **Automotive:** Today, 8 out of 10 of the best selling vehicles in Europe are fitted with SNR instrumented bearings.



- **Aerospace:** SNR, the partner/developer of major aeronautic and space programs. Know-how confirmed through numerous joint projects with the main players in these markets : the A380, the biggest commercial airplane in the world and the Ariane 5 space launcher.



- **Industry:** The diversity and technicality of SNR bearings is acknowledged in all the main sectors. SNR bearings provide solutions specific to industrial requirements: textile, agricultural, robotics, mining, steelworks, paper mills, cement works, agri-food, etc.





Traveling together towards the solution

Manufacturer, but first and foremost a partner/developer

SNR's expertise as a developer is a major asset contributing to our success with high-tech partnerships. SNR is certified ISO 9001: 2000, AQF2, ISO TS 16949 and ISO 14000.

This wide array of certifications allows us to meet all the requirements of the market.

Cutting edge tools for simulations

The efficiency of each solution is optimised by a comprehensive range of simulation tools:

- **Sharc:** calculates service life at the heart of the application,
- **Erode:** bearing calculations/design in their deformable environment,
- **Redjeu:** analysis of bearing assembly,
- **Ideas Master Series and Abaqus Standard:** CAD and non-linear and linear Finite Element Method optimizers.



SNR laboratory and test centre: an unrivalled validation tool.

Our experts have access to powerful means to test bearings assembled and in operation, means to analyze grease condition and detect material fatigue (spectroscopy, scanning electron microscope, etc.). These tests are used to verify material quality, design and manufacturing methods. They are carried out in accordance with the main standards (ISO 9000, EAQF 94, QS 9000, ISO TS 16949, ISO 14000, MCV, IMDS, COFRAC accreditations, etc.).



Our services: watching over the service life of each product, from design through to maintenance

The key to efficient/high level services is dependability and local support

SNR is a human sized company, we have learned to stay close to our customers to listen more intently, to bend and shape ourselves and respond to their needs. Through our in-depth background in bearings, we can offer technical expertise absolutely vital to optimise and ensure the reliability of the solutions we offer.

Maintenance guided by reliable analysis tools

To ensure the excellence and responsiveness of its maintenance services, SNR places its skills and know-how at the service of its clients to optimise solution integration.

- **Fitting advice and assistance on site during the start-up phase** to guarantee optimum implementation of the solutions offered.
- **Assembly of series solutions on site** by dedicated teams able to intervene throughout Europe.
- **Bearing, maintenance and visual inspection training** to complete assembly documents specific to each application.
- **Axle blocks bearing maintenance and reconditioning** to optimise investment while guaranteeing product safety and reliability.

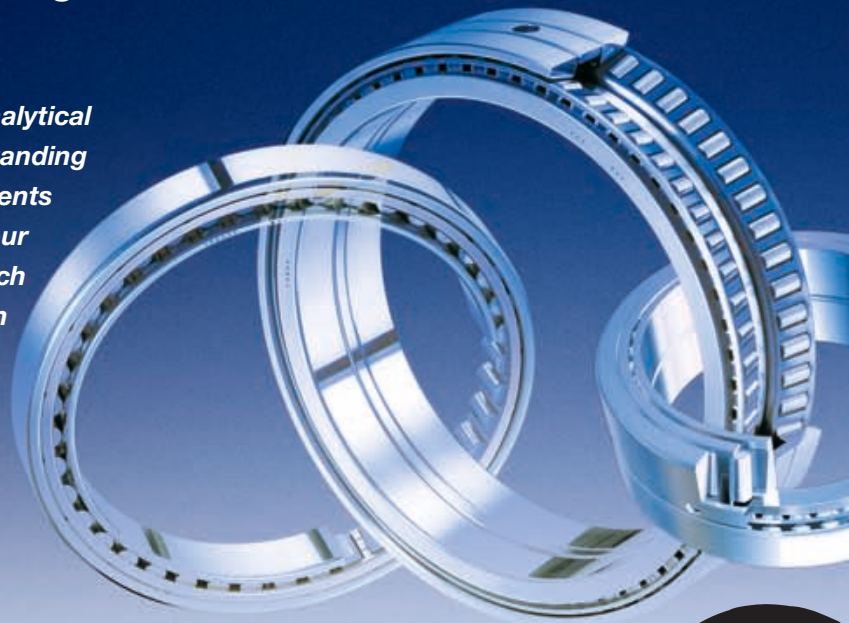




Your applications determine our solutions

Reach beyond the circle of the bearing for global solutions

“ Because we develop analytical knowledge and understanding of our clients' requirements and dedicate 5.5 % of our sales turnover to research and development, we can now offer innovative solutions that are tailored to the requirements of the rail industry. ”



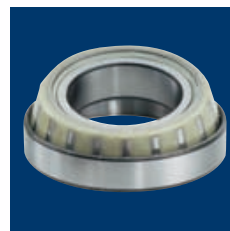
Rail: Millions of Km in total safety

To guarantee the durability and reliability of solutions in extreme conditions, SNR has achieved irreproachable mastery of surface treatment techniques through implementation of efficient, innovative processes:

- phosphate and copper plating: anti-fretting corrosion,
- deposition or ceramic rolling bodies: electrical isolation,
- nitriding: surface hardening.

LubSolid: lubrication under extreme conditions

A major, exclusive SNR invention, LubSolid may be used for life lubrication of any type of bearing, thus extending their service life and limiting maintenance costs. Therefore, the advantages for the rail industry include: the reduction of Dummy Brinell Effect problems, maintenance free operation and the assurance of lubrication in different environments. SNR offers 5 types of LubSolid, each adapted to a different application area.



ASB®: a new intelligent bearing standard

SNR, the pioneer of instrumented bearings, invented ASB® (Active Sensor Bearing), a patented mechatronic process incorporating a sensor precisely measuring wheel speed allowing it to modify its behaviour accordingly. The result of 20 years of research, ASB® has now become a standard adopted the world over by the biggest manufacturers and automotive equipment companies.



SNR - Industry



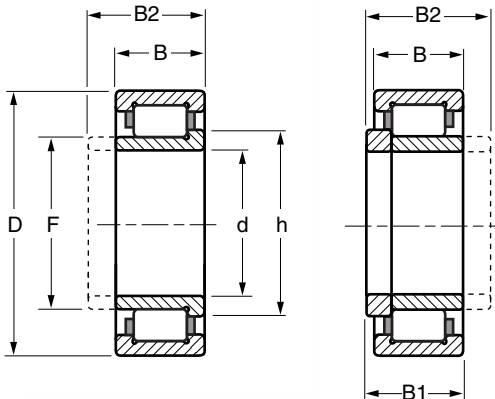


Roulements pour boîtes d'essieux

Axle boxes bearings

Roulements à rouleaux cylindriques

Cylindrical roller bearings

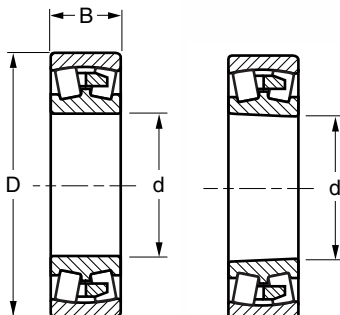


Symbole Name	Dimensions							Type	Capacité dynamique Dynamic load	Cage*
	d	D	B	B1	B2	F	h			
9980 G13 S02	120	240	80			150	161,3	NJ	600000	A
9981 G13 S02	120	240	80	80		150	161,3	NJP	600000	A
9980 G27 S01	120	240	80			150	161,3	NJ	570000	A
9981 G27 S01	120	240	80	80		150	161,3	NJP	570000	A
9993 G13 S02	130	240	80			158	169,1	NJ	530000	A
9994 G13 S03	130	240	80	86		158	169,1	NJP	530000	A
9994 G13 S04	130	240	80	80		158	169,1	NJP	530000	A
NJ-40950	130	240	80			157	168	NJ	550000	P
NJP-40951	130	240	80	80		157	168	NJP	550000	P
CR 10193 G1	160	270	73			82	199,1	NJ	590000	A
CR 10194 G1	160	270	73			82	199,1	NJP	590000	A

*A (acier / steel) M (massive en laiton / massive) P (polyamide chargé FV / reinforced polyamid)

Roulements à rouleaux sphériques

Spherical roller bearings

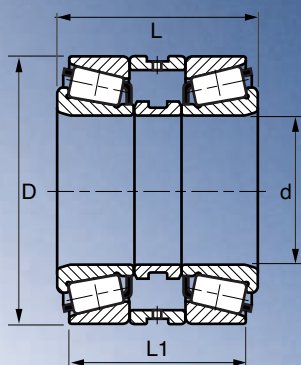


Symbole Name	Dimensions			Capacité dynamique Dynamic load	Cage*
	d	D	B		
22216 EA S01	80	140	33	218000	A
23220 EA S01	100	180	60,3	410000	A
23122 V S01	110	180	56	350000	M
23130 V S01	150	250	80	680000	M

*A (acier / steel) M (massive en laiton / massive) P (polyamide chargé FV / reinforced polyamid)

Ensembles de roulements à rouleaux coniques

Sets of tapered roller bearings

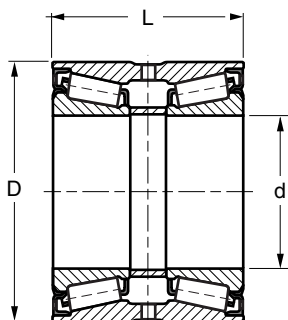


Symbole	Dimensions				Capacité dynamique	Cage*	Fa/Fr > e	
Name	d	D	L	L1	Dynamic load		e	y
FC 40342	45	100	97	85	158000			
32026A DB UA	130	200	140,36	118	345000			
ENS EC 40403 S02	130	219	181	155	475000	A	0,32	1,88
ENS EC 10697 S07	130	220	181	155	475000	A	0,32	1,88
ENS HM 237537 N513 B	165	290	176	145	650000	A	0,32	1,88
ENS HM 237537 N513 A	165	290	171,68	140	650000	A	0,32	1,88
ENS 122978 N125 F	199,974	317,5	158,15	126,4	640000	A	0,3	2,03

*A (acier / steel) M (massive en laiton / massive) P (polyamide chargé FV / reinforced polyamid)

Cartouches biconiques

Twin Line



Symbole	Dimensions			Capacité dynamique	Cage*	Fa/Fr > e	
Name	d	D	L	Dynamic load		e	y
ETC 23945 V2	130	220	140	815000	P	0,32	3,15
FC 41411	130	240	160	950000	P	0,30	3,29
FC 12891	150	250	160	960000	P	0,32	3,15
FC 12790 S02	150	250	185	1180000	A	0,32	3,15
FC 12790 S05	150	250	185	1180000	P	0,32	3,15

*A (acier / steel) M (massive en laiton / massive) P (polyamide chargé FV / reinforced polyamid)

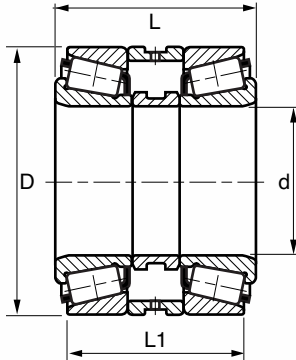


Roulements pour transmissions et moteurs

Gear box and motor bearings

Ensembles de roulements à rouleaux coniques

Sets of tapered roller bearings

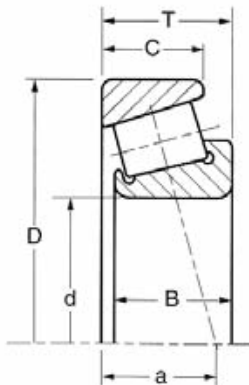


Symbole Name	Dimensions				Capacité dynamique Dynamic load	Cage*	Fa/Fr > e	
	d	D	L	L1			e	y
FC 12241	216,408	285,75	98,424	92,76	640000	A	0,49	1,23
FC 12211	266,7	325,438	77,025	70	209000	A	0,37	1,64
ENS HM-813846 N 810 S2	69,850	127	73,026	73,026	250000	A	0,5	2
ENS HM-813846 N 810 S3	69,850	127	73,026	73,026	250000	P	0,5	2

*A (acier / steel) M (massive en laiton / massive) P (polyamide chargé FV / reinforced polyamid)

Roulements à rouleaux coniques

Tapered roller bearings

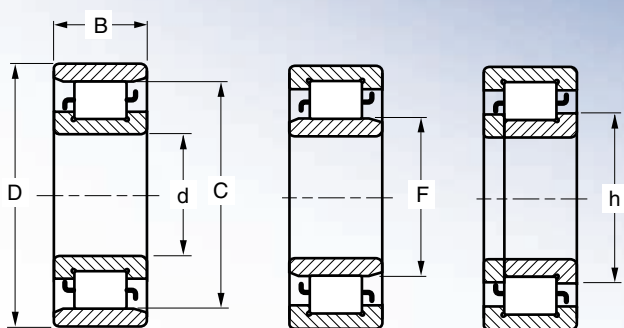


Symbole Name	Dimensions					Capacité dynamique Dynamic load	Cage*	Fa/Fr > e	
	d	D	T	B	C			e	y
LM 742747/710	216,408	285,75	49,212	49,212	34,925	370000	A	0,49	1,23
EC-40429	225	295	49	49	34,925	365000	A	0,51	1,19
EC-12514	266,7	325,438	33,47	33,47	25,4	209000	A	0,37	1,64

*A (acier / steel) M (massive en laiton / massive) P (polyamide chargé FV / reinforced polyamid)

Roulements à rouleaux cylindriques

Cylindrical roller bearings



Symbole	Dimensions						Capacité dynamique	Cage*
Name	d	D	B	C	F	h	Dynamic load	
NU 2313E S02	65	140	48		82,5		255000	A
NUP 2313E S02	65	140	48		82,5	90,9	255000	A
NU 2314E S01	70	150	51		89		295000	A
NUP 2314E S01	70	150	51		89	97,4	295000	A
NU 2315 E S01	75	160	55		95		340000	A
NUP 2315E S01	75	160	55		95	104	340000	A
NU 216E S01	80	140	26		95,3		138000	M
NU 40288 S01	80	170	55		101		360000	A
NU 2220E S02	100	180	46		119		360000	A
9980 S05	110	240	80		150		600000	A
NU 324E S01	120	260	55		153,895		530000	M
NU 324E S02	120	260	55		153,895		530000	M
NU 1944 S03	220	300	38		236		360000	M
N 9907 S06	230	350	45	316			620000	M
NU 2852 S03	260	320	36		273		320000	M

*A (acier / steel) M (massive en laiton / massive) P (polyamide chargé FV / reinforced polyamid)

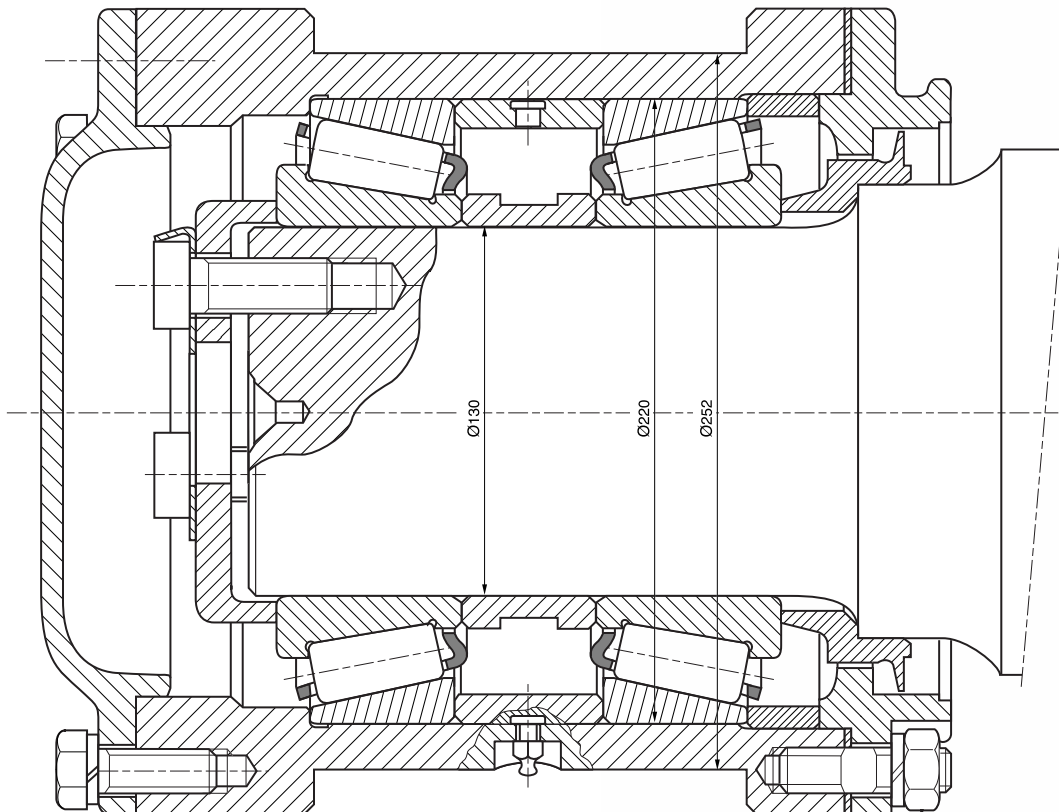


Boîtes d'essieux

Axle boxes

EMDBT - 400 677

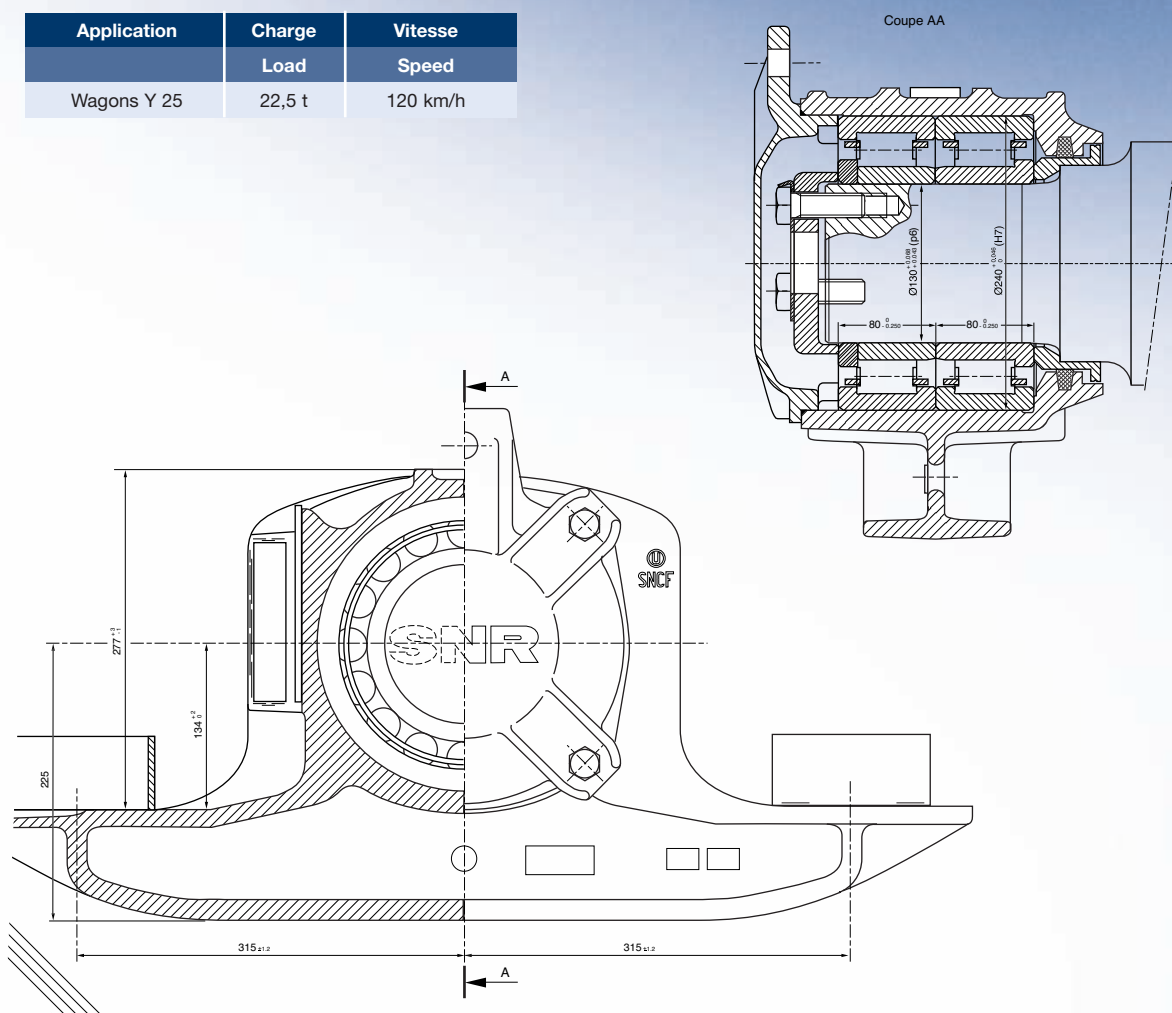
Application	Charge	Vitesse
	Load	Speed
Corail / AM 96 / I 11	18 t	200 km/h

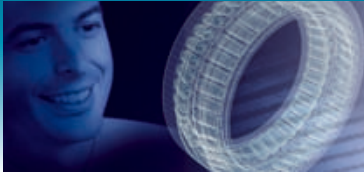




EMDBT - 400 685

Application	Charge	Vitesse
	Load	Speed
Wagons Y 25	22,5 t	120 km/h

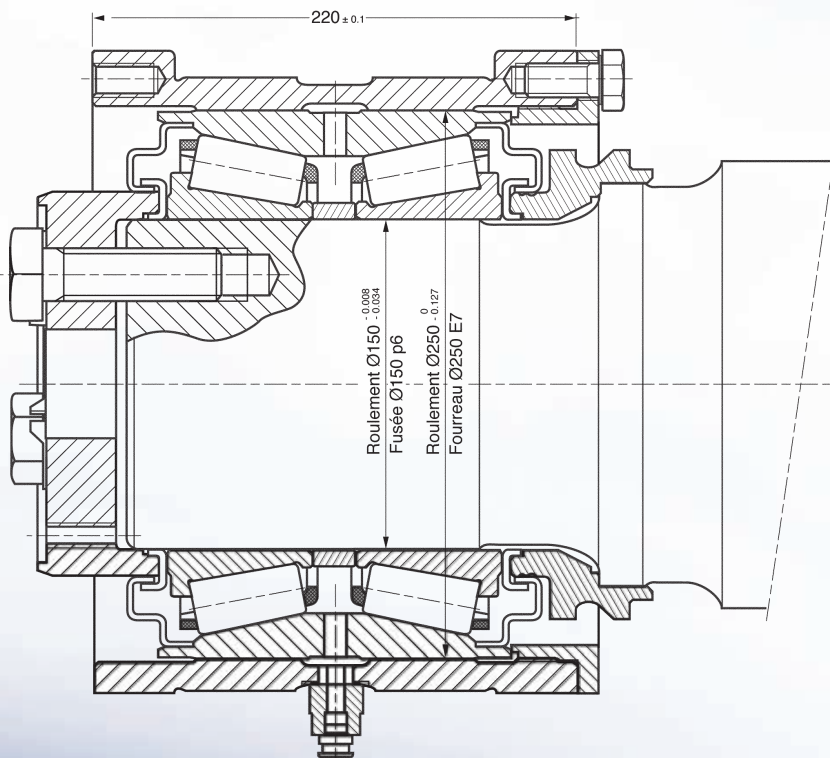




Boîtes d'essieux Axle boxes

EMDBT - 400 688

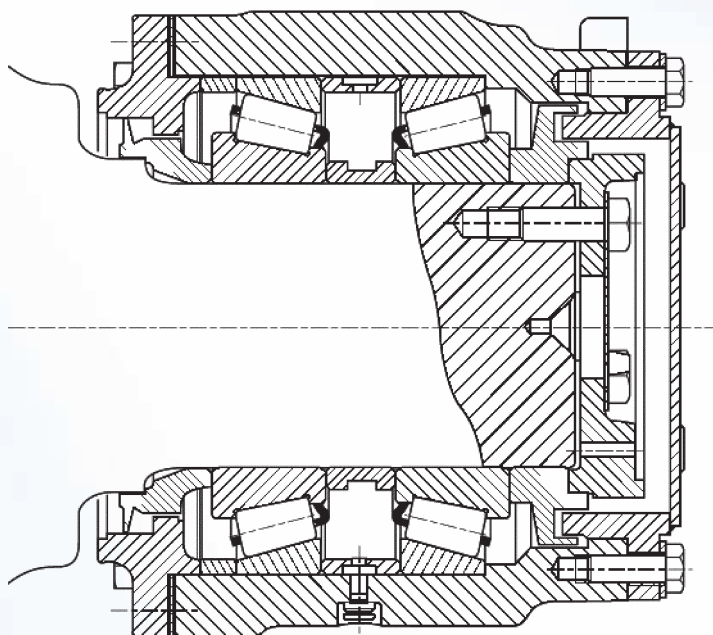
Application	Charge	Vitesse
	Load	Speed
Z-TER	18 t	200 km/h

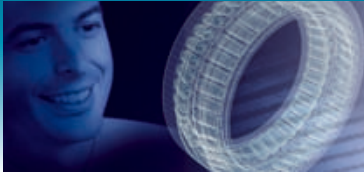




TER-2N-NG

Application	Charge	Vitesse
	Load	Speed
TER-2N-NG	20 t	160 km/h



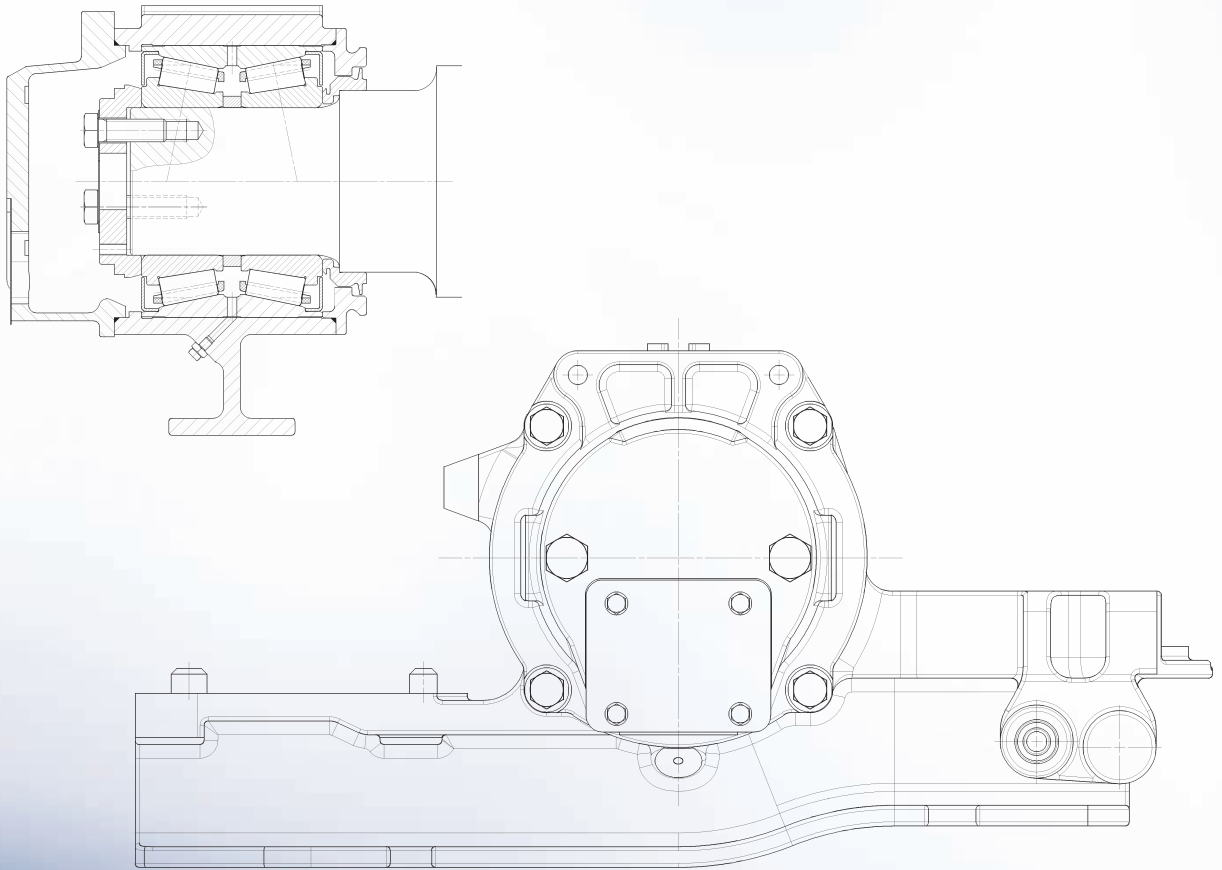


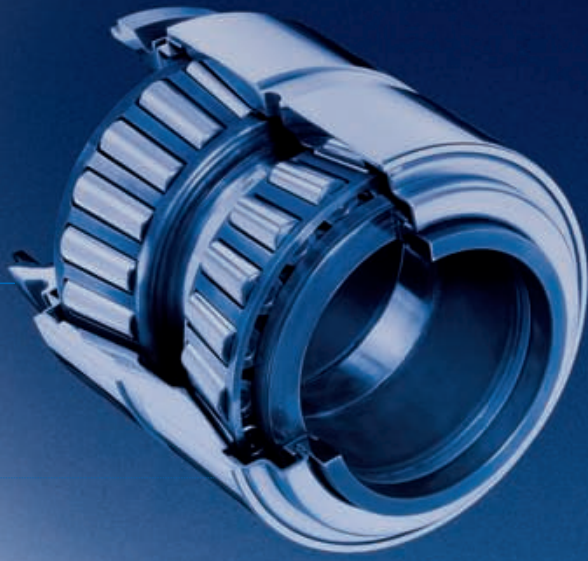
Boîtes d'essieux

Axle boxes

EMDBT - 400 695

Application	Charge Load	Vitesse Speed
AGC Autorail Grande Capacité	19 t	160 km/h





Notes

Europe

FRANCE

SNR Paris	40, rue Jean Bleuzen B.P. 49 92174 Vanves Cedex	Tél. 01 40 93 66 00 Fax. 01 40 93 66 10	SNR Lyon Europe*	Le Florentin - 71, chemin du Moulin Carron - B.P. 8 69570 Dardilly	Tél. 04 78 66 68 00 Fax. 04 78 66 68 20
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SNR Intermondial (Overseas)

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