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*D R I E – D Lagertechnik bv*  
*the right perspective*

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***D-GLIDE MAINTENANCE***  
***FREE PLAIN BEARINGS***



***DATA SHEETS***





## **DATA SHEETS D-GLIDE**

### **1. GENERAL INFORMATION D-GLIDE**

D-glide is the family name of a series of modern composite bearing materials. All varieties consist of a combination of modern man-made fibres and resins and are being produced according to the latest technology.

The D-glide P, F and X qualities contain, amongst other ingredients, PTFE. This has resulted in friction values for these materials that are on an unequalled low level, compared with other plastic bearing materials as well as with respect to conventional lubricated plain bearings. Also the 'stick-slip' behaviour, for practical applications a very important property, is better than of other plain bearings.

A major advantage of D-glide bearing is that in most cases they do not need lubrication. Depending on the application, still increases in lifetime compared with, for example, 'bearing bronze' of 2 to 10 times are feasible. Lubrication also does not have a bad influence and not only oils and greases, but almost all non-abrasive media can act as lubricant.

Most D-glide qualities do not guide electricity which means that in corrosive environments corrosion of shafts and other surrounding metal parts is being prevented. Because the materials are virtually inert reactions with, for example, food and cleaning substances almost never occur. Absorption of water and other fluids is negligible. Besides the 4 standard qualities it is also possible to quickly and efficiently 'tailor make' a bearing quality, if for a specific application this leads to a better result.

Thanks to the great strength of D-glide (up to more than 400 MPa), very high effective loads are possible. The load limit always depends on the application of a bearing but real loads of over 200 MPa are attainable. This is 10 times more than in a well-designed construction would be allowed on a bronze bearing! D-glide X does not creep and of the other D-glide qualities a non-creeping version is available.

D-glide is delivered as finished bearing in all possible shapes and dimensions and as sheet and tube material. There also is a series of maintenance and corrosion free spherical bearings.

DRIE-D not only supplies the materials, but also the knowledge to make optimum use of them. The activities range from delivery of the materials to simple bearing calculations to engineering of complex bearing constructions to turnkey delivery of complete projects.

**Thanks to this unique combination of properties the result with DRIE-D's D-glide bearings virtually always is a far better bearing construction or a bearing construction with a better price-performance ratio.**





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### **DESCRIPTION D-GLIDE FT**

D-glide FT is D-glide F with a special 'high PTFE content' sliding layer. With respect to friction values and wear rates there is no material that comes even close to PTFE but mechanical properties of PTFE are poor. For this reason most D-glide qualities contain PTFE, homogeneously dispersed in the material but the percentage that can be included this way is limited.

To increase the percentage of PTFE in the contact surface DRIE-D has developed D-glide FT. The sliding layer does not have the full strength of normal D-glide F but with limited layer thicknesses this is hardly significant for the bearing as a whole. Compared with D-glide F the friction values and wear rates are reduced by 20 tot 80 percent and, even more important, there is hardly if difference between static and dynamic friction. This means that the chance that a D-glide FT bearing originates any noise of moves in a non-uniform motion is almost reduced to zero.

Because the sliding layer is not as tough as normal D-glide F the resistance against abrasive wear is slightly reduced. There are more bearing materials available with a thin PTFE based sliding layer but these normally have metal 'carriers', meaning that when the sliding layer gets damaged or is worn away there is no bearing function left resulting in acute stand still, damaged counter faces and other unwanted effect. One of the 'charms' of D-glide FT is that when for some reason the sliding layer is no longer functional there will be a normal D-glide F contact surface left. This means, going from an excellent bearing to a good bearing instead of going from a good bearing to no bearing at all. In brief: D-glide FT is a good choice for applications where lower wear rates or friction values are required than possible with D-glide P or F.

The main properties of D-glide F are summarised in the table below.

<b>property</b>	<b>unit</b>	
compressive strength	(MPa)	300
shear strength	(MPa)	95
stiffness under compression	(MPa)	1600
density	(10 <sup>3</sup> kg/m <sup>3</sup> )	1.35
water absorption, submerged	(%)	0.3
coefficient of thermal expansion	(10 <sup>-6</sup> /°C)	50
chemical resistance	(-)	good
colour	(-)	light brown
maximum temperature	(°C)	150
minimum temperature	(°C)	<-200
advised maximum working temperature	(°C)	100
typical friction value, dry	(-)	0.04 – 0.08
general wear resistance	(-)	excellent
resistance against abrasive wear	(-)	average



## COMPARISON PROPERTIES LARGE SPHERICAL BEARINGS

	<b>D-glide Sphericals</b>	<b>GEP bearings (SKF)</b>	<b>Steel-on-steel</b>	<b>Steel - PTFE layer</b>
<b>Main principle</b>	(Stainless) steel ball running in (stainless) steel housing with D glide sliding layer	Chrome plated steel ball running in chrome plated steel housing with Polyamide sliding layer	Treated steel ball running in treated steel housing.	Chrome plated steel ball running in chrome plated steel housing with PTFE sliding layer
<b>Modes of use</b>	Maintenance free, lubrication is allowed, dry or wet	Sealing en lubrication required, water is not allowed	Sealing en lubrication required, water is not allowed	Clean dry running only, lubrication and / or water will damage the bearing
<b>Designs</b>	According to standards and non-standard	Available in one standard series	Available in various standard series	Available in one standard series
<b>Metal parts</b>	In carbon steel, high-alloy steel and stainless steel, treated or not	Only in chrome plated carbon steel	Available in various steel qualities	Available in steel and stainless steel
<b>Static contact pressures</b>	360 - 480 MPa	120 MPa	425 MPa	325 MPa
<b>Dynamic contact pressures</b>	150 - 210 MPa	80 MPa	85 MPa	165 MPa
<b>Shock loads</b>	Allowed, internal damping due to elastic sliding layer	Suitable	Not advised	Not advised, fatigue may lead to bearing failure
<b>Micro movements</b>	Suitable	Allowed	Not allowed (Surface fatigue)	Not allowed (fatigue)
<b>Open air' use</b>	Suitable	Suitable with lubrication and seals	Suitable with lubrication and seals	Suitable with 'extreme' external seals. Lubricant not allowed in the bearings



# D - glide



مواد مدرن کامپوزیتی بسیار مقاومی هستند که از الیاف پیشرفته ترکیب شده با رزین - و در مواردی خاص از ترکیبات دیگر همچون PTFE - با تکنولوژی روز دنیا ساخته شده اند . ساختار این مواد به گونه ای است که پایین ترین ضربه اصطکاک را نسبت به مواد مشابه دارند . به طور مثال ضربه اصطکاک D-glide نسبت به برنرها  $\frac{1}{3}$  می باشد و این پارامتر تاثیر بسیار زیادی در طراحی تجهیزات مرتبط دارد .

از دیگر موارد قابل ذکر در مورد این مواد میتوان به خود روغناک بودن در اکثر شرایط ذکر کرد و این در حالی است که طول عمر کاری این محصولات نسبت به مواد مشابه بسیار بیشتر است . بطور مثال طول عمر این محصولات برای شرایط کاری یکسان نسبت به برنرها - دیواگلایدها - از ۲ تا ۱۰ برابر است .

آزمایشات صورت گرفته توسط مراکز معتبر آزمایشگاهی موید این نکته است که رفتار STICK-SLIP نیز نسبت به محصولات مشابه وضعیت بسیار بهتری را از خود نشان میدهد و با توجه به کاهش چشمگیر ضربه اصطکاک این رفتار به سمتی حرکت کرده است که ضربه اصطکاک در حالت استاتیکی و دینامیک تقریباً مساوی شده است .

این محصولات دارای رفتار شیمیایی خنثی بوده و عایق الکتریکی هستند و با توجه به ضربه نفوذ بسیار پایینی که دارند مناسب برای استفاده در صنایع شیمیایی و غذایی هستند .

خانواده محصولات D-glide دارای نرخ خوردگی و سایشی بسیار پایینی بوده و با توجه به وزن کمتری که نسبت به دیگر مواد مشابه دارند انتخاب بسیار مناسبی برای جایگزینی و استفاده در شرایط کاری بسیار سخت هستند .

## موارد استفاده D-glide :

این محصولات که با آخرین و به روزترین تکنولوژی روز ساخته شده اند میتوانند جایگزین مناسبی برای یاتاقان ها ، برنرها ، دیواگلایدها ، بوش ها و ... باشند .

با توجه به گستردگی شرایط کاری تعریف شده برای D-glide ، این امکان وجود دارد که در سخت ترین شرایط که امکان تعمیر و نگهداری وجود ندارد و نیاز به طول عمر کاری بالا احساس میشود از این محصولات استفاده شود .

این محصولات در صنایع مختلف کاربرد دارند از جمله :

- ◆ تجهیزات بنادر
- ◆ تجهیزات فراساحلی
- ◆ تجهیزات برق آبی
- ◆ سازه های عمرانی
- ◆ حمل و نقل ریلی
- ◆ و کاربردهای فراوان دیگر



# جدول مشخصات

Property	unit	D-glide P	D-glide F	D-glide FC	D-glide U
compressive strength	(MPa)	325	350	350	390
shear strength	(MPa)	95	105	105	110
stiffness under compression	(MPa)	2000	1600	1600	2200
density	(10 <sup>3</sup> kg/m <sup>3</sup> )	1.25	1.35	1.35	1.4
water absorption	(%)	0.15	0.30	0.30	0.30
coefficient of thermal expansion	(10 <sup>-6</sup> /°C)	65	50	50	35
chemical resistance	(-)	good	good	good	good
colour	(-)	blue (7)	light brown	orange-pink	light brown
maximum temperature	(°C)	130	150	150	250
minimum temperature	(°C)	<-200	<-200	<-200	<-200
advised maximum working temperature	(°C)	80	100	100	180
typical friction value	(-)	0.05 - 0.12	0.04 - 0.10	0.05 - 0.10	0.06 - 0.12
general wear resistance	(-)	very good	excellent	excellent	very good
resistance against abrasive wear	(-)	good	very good	excellent	excellent
minimal hardness counter face material	(HB)	170	170	180	200
ideal hardness counter face material	(HB)	190	190	200	220
desired roughness counter face material	(Ra, μm)	<1.6	<1.6	<1.6	<1.6



## در صورت استفاده از D-glide بجای برنز در Stoplog :

• کاهش چشمگیر ضریب اصطکاک

• کاهش نیروی BALLAST

• سبکتر شدن وزن دریچه

• استفاده از تجهیزات سبکتر برای حرکت دادن دریچه

• کاهش هزینه خرید تجهیزات (SERVOMOTOR & WINCH)

در صنعت هیدرومکانیک نیز همانند دیگر صنایع ، کاربردهای D-glide بسیار متنوع است . این محصولات میتوانند جایگزین بسیار خوبی برای برنزها در دریچه ها باشند و ...



خن آوری نوین نیرو 

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