A Smooth Path To Drive Coupling Selection

Engineers and designers working on power transmission applications can often face a daunting task when it comes to specifying the most appropriate drive coupling for the task in hand. Detailed consideration must be given to both sides of the drive equation, input and output, with regard to torque, shock loads, starting frequency, temperature and environmental conditions, but where to begin.

In this informative article, David Proud General Manager of Reich Drive Systems UK explains how to navigate through what can sometimes be seen as a technical minefield for designers and engineers.

Drive couplings vary greatly in their design and capabilities, so for any given application engineers must ensure that they specify the drive coupling correctly to ensure reliable efficient, and in the more challenging applications, safe operation.

A detailed review of what the coupling will be subjected to in use is an essential starting point. Factors such as torque transmission, speed ranges, running start / stops and potential shock loadings are just some of the key elements in the selection of the coupling. However, we must also consider alignment between the various components, the environmental operating conditions that could include high temperatures or moisture etc., and any maintenance requirements or restrictions. There may also be potential limitations on available space, size and / or weight, which will have to be taken into account. The prime mover, diesel or gas engine, hydraulic or electric motor will also be influential in the specification and selection of the drive coupling.

Get it right, and the coupling will provide years of uninterrupted service, requiring little or no maintenance in its own right, whilst ensuring that mating components are protected from undue stresses and keeping downtime to a minimum.

Common Mistakes Can Be Costly

There are a number of commonly made mistakes, which result in the wrong coupling

being specified. This can have serious consequences both for the coupling and the other elements in the drive train. Often, it does not take long before these issues rise to the attention of maintenance engineers in the form of a catastrophic failure of the coupling and hours of unplanned downtime. Other less visible effects will be undue wear on bearings, shafts and gears, which will ultimately impact motors or gearboxes.

Before making a final decision on selecting the drive coupling the specifier must fully evaluate and understand the forces and loads that will be applied to the coupling in use. Making an “educated guess” at these values is not an option and could result in either a coupling being specified which is not fully up to the job, or design overkill, which would result in an unnecessarily larger and more expensive solution to the application.

The specific application will dictate whether the coupling required is a disc coupling, shaft to shaft coupling, auxiliary coupling or other variant, however it is essential that consideration is given to factors such as the torque rating and torsional stiffness required for the task. Generally, couplings with a higher torque rating will be larger and less flexible. In addition, the degree of axial, radial or angular misalignment that the coupling will be required to compensate for will influence choice, and it is essential that the coupling to be used, is able to meet these criteria, but have the capacity to accommodate a level of unexpected deflection whilst in service without failing.

Another contributing factor, which will influence success, is how the coupling is mounted. In applications where there are minimal shock or reversing loads, keyways and taper bushes will be a reliable solution. For applications where there may be high shock loads it may be preferable to avoid a keyway solution and instead opt for a taper bush fixing, or couplings with shrink discs, which will also provide backlash free operation.

From a maintenance perspective, the time required to remove or replace a coupling or any change parts, is a major consideration. Therefore, the selection of a coupling which not only meets all of the technical and application requirements, but is either maintenance free, or has the ability to have change parts replaced in-situ will bring significant benefits to uptimes and efficiency.

If there is any doubt on the part of the individual responsible for specifying and selecting the coupling, seeking expert advice from the manufacturer will both eliminate risks and ensure longevity and reliability in operation. With a history spanning over 70 years, Reich Kupplungen has built up unrivalled expertise in the design and manufacture of drive couplings for use across a wide range of industries and applications. The company also embraces a D2C (design to customer) principle, which allows the creation of customised high-quality and long-lasting power transmission products in collaboration with the customer and their specific requirements.

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