t790 SERIES
TORSION BAR SHAFT

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DESCRIPTION

The t790 is a special shaft for use in highly dynamic applications such as motor sports test beds. The shaft comprises two CV joints and an encapsulated torsion bar, which runs on bearings inside a guide tube. It therefore benefits from a very good relationship between between frequency to torsional stiffness. The patented design allows low stiffness without having to compromise on the desirable high rotational speed.

The t790 is available in with CV joint sizes from CV05 to CV21. Special designs are also available on request.

Each t790 shaft is tailored according to customer requirements.

NAMING

The product is named according to the following convention:

t790-cccc-CVxx-llll

- llll: length [mm]
- xx: joint size
- cccc: dynamic stiffness [Nm/rad]
- t790: product name

Example: t790-3500-CV15-0755

OPERATING RANGE

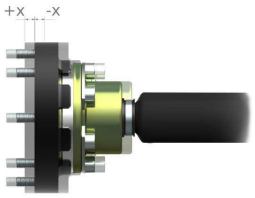
Torque: up to 3500 Nm
Speed: up to 20000 rpm

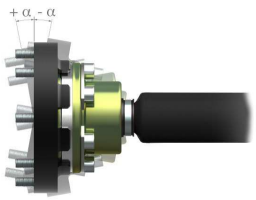
BENEFITS

- suitable for very high speeds
- compact design
- long life
- low maintenance

FUNCTION

The CV joint takes up the longitudinal, angular and axial displacement without adding any higher order speed or torque fluctuations to the drive train.





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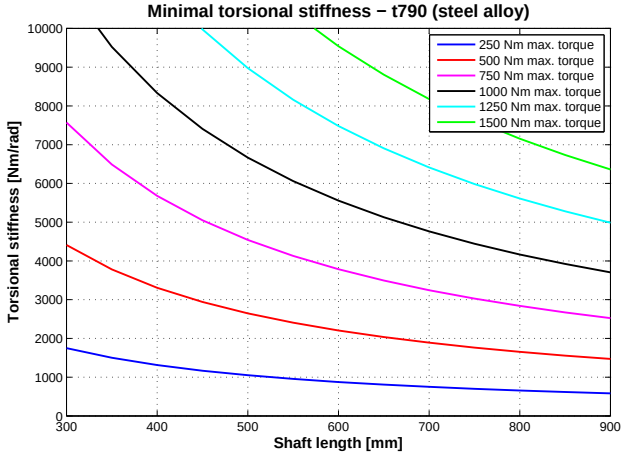
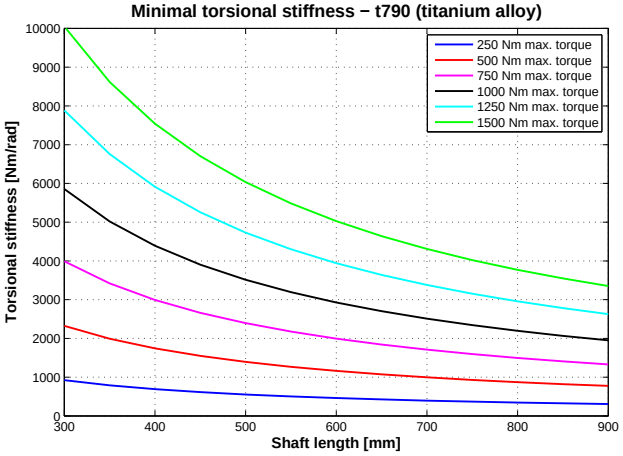
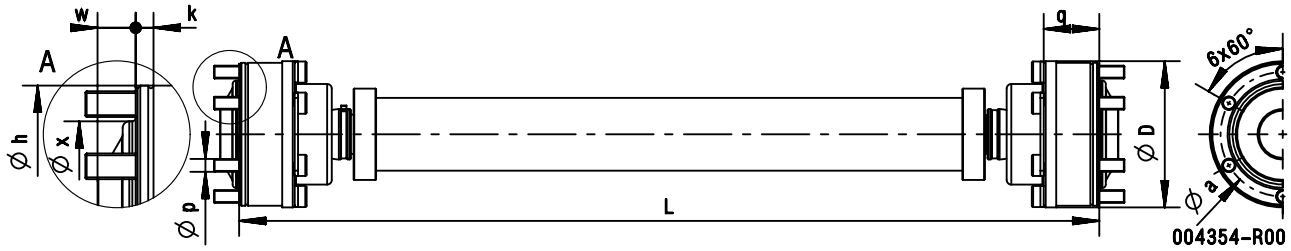
t790		
Maximum torque	[Nm]	3500
Maximum speed	[rpm]	20000
Minimum torsional stiffness	[Nm/rad]	500
Maximum length	[mm]	900

If you need a t790 shaft for a certain speed, you should be aware that the minimum length of the shaft is dependent on the torsional stiffness. This dependence is represented in the following diagrams, which is shown for for the two typical torsion bar materials: steel (left) and titanium (right). The encapsulation in an aluminum tube shifts the usual problems associated with the bending frequency of a torsion bar into a much higher speed range. That means the t790 shaft can be operated up to speeds of 20000 rpm.







Shaft	Joint	D	a	$h^{+0.00}_{-0.05}$	k	p	q	w	x
		[mm]	[mm]	[mm]	[mm]	[-]	[mm]	[mm]	[mm]
t70x	CV05	88.40	74.0	86.00	10.5	M8	22.80	14.5	65.0
	CV10	96.00	80.0	94.00	6.0	M8	33.80	15.0	64.0
	CV15	110.50	94.0	108.00	6.0	M10	42.00	14.4	81.0
	CV21	132.00	108.0	128.00	6.0	M12	47.90	18.1	90.0

The installed length L is dependent on the application and is limited by the type of design and maximum speed.

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