

4.4

Flexible Coupling

MAN TURBO AG.

Schweiz, Hardstrasse 305,
CH – 8005 Zurich

P.O.NO. : 4004662 Date : 26th January 2005

MAN TURBO AG. Material Code: 10301918.

Drawing No. : 04443-00. Rev-C.

Coupling No. : 41496

Project : KOSAIR 2004

Documentation

EUROFLEX TRANSMISSIONS (India) Pvt.Ltd.,

Plot No.99,C.I.E. Phase-II, Gandhinagar,Balanagar,
Hyderabad – 500 037. A.P. INDIA.
Phone:+91-40-23079775,23076970 Fax:40-23079523
e-mail: euroflex@satyam.net.in

50921



TEST CERTIFICATES

COUPLING NO 41496

INDEX

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TRANSMISSIONS (INDIA) PVT. LTD.

Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.
Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C.-1/No: 1496

DATE: 12-04-2005.

CERTIFICATE OF VISUAL AND PRE-DESPATCH INSPECTION

To:

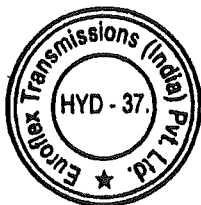
MAN TURBO AG.
Schweiz, Hardstrasse 305,
CH - 8005. Zurich.

This is to certify that the following Coupling manufactured by us against your Purchase Order : 4004662, DT: 26-01-2005. as detailed below, has been cleared for dispatch upon final visual and pre-despatch inspection carried out as per our internal checklist QF/PROD/014. It is also certified that the inspections confirm that all the requirements of the Purchase Order, have been met fully.

MAN TURBO		DESCRIPTION	QTY.
SL. NO.	MATL. CODE		
1.	10301918	FLEXIBLE COUPLING MODEL NO. : 10GBH-330-S. DRAWING NO.: 04443-00. Rev-C. COUPLING NO.: 41496. PROJECT : KOSAIR 2004	01 No.

For Euroflex Transmissions (India) Pvt. Limited.

Q. C. DEPT.



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TRANSMISSIONS (INDIA) PVT. LTD.

Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.
Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C.-1/No: 1496

DATE: 12-04-2005.

CERTIFICATE OF COMPLIANCE AND GUARANTEE

To:

MAN TURBO AG.
Schweiz, Hardstrasse 305,
CH - 8005. Zurich.

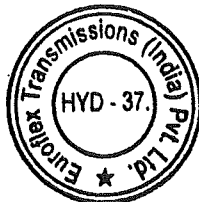
This is to certify that the following Coupling manufactured by us against your **Purchase Order : 4004662, DT: 26-01-2005.** as detailed below is guaranteed to be free of all material and manufacturing defects.

MAN TURBO		DESCRIPTION	QTY.
SL. NO.	MATL. CODE		
1.	10301918	FLEXIBLE COUPLING MODEL NO. : 10GBH-330-S. DRAWING NO.: 04443-00. Rev-C. COUPLING NO.: 41496. PROJECT : KOSAIR 2004	01 No.

The Coupling is further guaranteed for satisfactory performance for a period of 24 weeks after successful commissioning, latest 36 months after delivery MAN Turbo to end customer, provided the coupling is operated within the specified parameters of power / speed and misalignment as per approved drawing.

For Euroflex Transmissions (India) Pvt. Limited.

Q. C. DEPT.



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TRANSMISSIONS (INDIA) PVT. LTD.

Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.
Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C. -2/No: 2496/1.

DATE: 10-04-2004.

CERTIFICATE OF DYNAMIC BALANCE

Customer: **MAN TURBO AG Schweiz.**

P.O. No: **4004662,**

DT: **26-01-2005.**

MAN Turbo Material Code: **10301918**

Project: **KOSAIR 2004**

Coupling No: **41496.**

Balance Speed: **850 RPM**

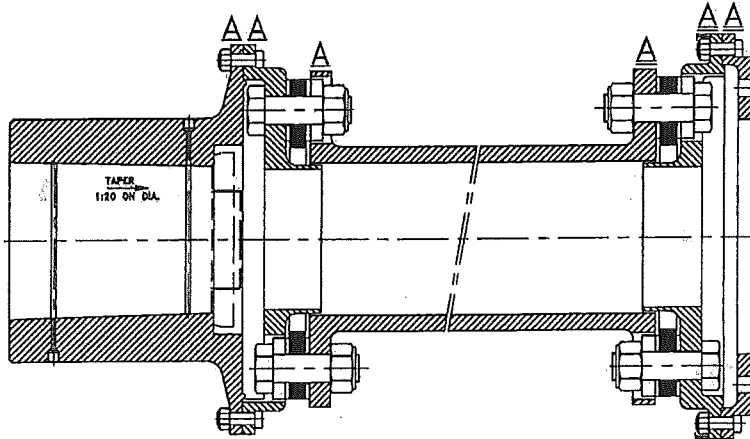
Balance Spec : **API 671 / 2.6.3.7 (3rd Edition)** Balance Required **929.94 gm-mm (per plane)**

Balance Achieved: **LHS 34.05 gm-mm at 276°**

RHS 23.85 gm-mm at 96°

Drawing No.: **04443-00. Rev-C.**

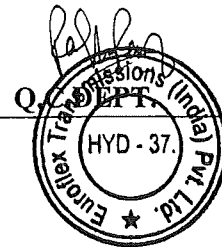
Model No.: **10GBH-330-S.**



RUNOUT	A	A	A	A	A	A
Flange Datum 1.	0.000	0.000	0.000	0.000	0.000	0.000
2.	+0.005	-0.005	+0.005	-0.005	-0.010	+0.005
3.	+0.010	+0.010	+0.015	-0.020	-0.015	-0.010
4.	+0.005	+0.005	+0.010	-0.005	-0.010	-0.010

Remarks: Permissible run out at Flanges A & A = 0.020 mm (T I R)

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TRANSMISSIONS (INDIA) PVT. LTD.
Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.
Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C. -2/No: 2496/2.

DATE: 08-04-2004.

CERTIFICATE OF DYNAMIC BALANCE (COMPONENT BALANCING)

Customer: MAN TURBO AG Schweiz.

P.O. No: 4004662,

DT: 26-01-2005.

MAN Turbo Material Code: 10301918

Project: KOSAIR 2004

Coupling No: 41496.

Balance Speed: 850 RPM

Balance Spec : API 671 / 2.6.3.5 (3rd Edition)

Balance Required 257.5 gm-mm (per plane)

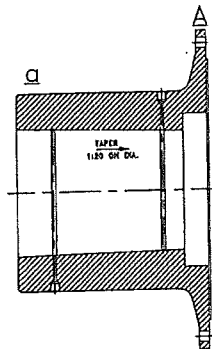
Balance Achieved: LHS 8.1 gm-mm at 360°

RHS 12.73 gm-mm at 323°

Drawing No.: 04443-00. Rev-C.

Model No.: 10GBH-330-S.

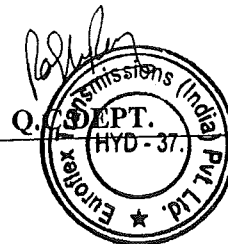
MOTOR HUB:



RUNOUT	a	A
Flange Datum 1.	0.000	0.000
2.	-0.010	-0.005
3.	-0.015	-0.005
4.	-0.005	+0.005

Remarks: Permissible run out at Flanges a & A = 0.020 mm (T I R)

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Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.
Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C. -2/No: 2496/3.

DATE: 08-04-2004.

CERTIFICATE OF DYNAMIC BALANCE (COMPONENT BALANCING)

Customer: MAN TURBO AG Schweiz.

P.O. No: 4004662,

DT: 26-01-2005.

MAN Turbo Material Code: 10301918

Project: KOSAIR 2004

Coupling No: 41496.

Balance Speed: 850 RPM

Balance Spec : API 671 / 2.6.3.5 (3rd Edition)

Balance Required 319.6 gm-mm

Balance Achieved: 5.7 gm-mm at 260°

Drawing No.: 04443-00. Rev-C.

Model No.: 10GBH-330-S.

ADAPTOR # 3:



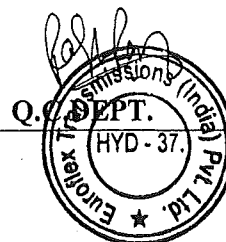
RUNOUT

A

Flange Datum 1.	0.000
2.	+0.010
3.	+0.015
4.	+0.005

Remarks: Permissible run out at Flanges A = 0.020 mm (T I R)

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TRANSMISSIONS (INDIA) PVT. LTD.
Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.
Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C. -3/No: 3496.

DATE: 12-04-2005.

ULTRASONIC INSPECTION REPORT

Customer: **MAN TURBO AG Schweiz.**

P.O. No. : **4004662,**

Dt.: **26-01-2005.**

MAN Turbo Material Code: **10301918**

Project: **KOSAIR 2004**

Coupling No. : **41496.**

Component: **HUB, SPACER & ADAPTORS.**

Material **BS970 709 / 080 M40**

Drawing No. : **04443-00. Rev-C.**

Model No.: **10GBH-330-S**

Surface condition **PROOF MACHINED**

Couplant used : **OIL**

Equipment Used: **EEC PX10**

Size of Probe: **19.0 mm**

Frequency Range **4.0 MHz**

Method of Calibration: **I I W V₁ BLOCK & Reference Blocks.**

Tested to Spec. **ASTM A 388**

Acceptable limit: **2mm FBH.**

Extent of scanning: **100% on Radial & Axial Direction.**

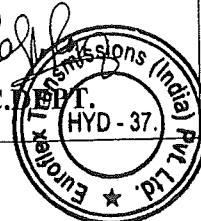
Inspection Remarks: **NO RECORDABLE INDICATIONS OBSERVED AND MATERIALS FOUND SATISFACTORY.**

Sl. No.	Description	Drg. No	Qty.	Heat No.	Remarks
1.	MOTOR HUB	04443-51	1	RF 4212	NONE
2.	SPACER	04443-61	1	RF 4214	NONE
3.	ADAPTOR # 1	04443-71	1	RF 4214	NONE
4.	ADAPTOR # 2	04443-72	1	RF 4207	NONE
5.	ADAPTOR # 3	04443-73	1	RF 4207	NONE

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U.V. Soma Rao (Level II)

Q.C. DEPT.



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Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.
Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C. -4/No: 3496/1.

DATE: 12-04-2005.

CHEMICAL ANALYSIS CERTIFICATE

Customer: MAN TURBO AG Schweiz.

P.O. No. : 4004662, Dt.: 26-01-2005.

Project : KOSAIR 2004.

MAN Turbo Material Code: 10301918.

Drawing No.: 04443-00. Rev-C.

Coupling No.: 41496.

Heat No.: RF 4212.

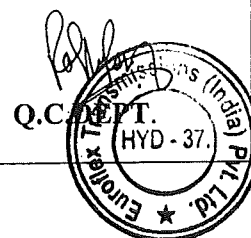
Description: HUB.

Supplier TC Ref No. : EU 436 / 04-05, Dt.: 03-03-2005.

HUB

Description	C%	Mn%	Ni%	Cr%	Mo%	S%	P%	Others%	Heat No.
Min.	0.36	0.70	----	0.90	0.25	---	---		
BS 970 709 M40									
Max.	0.44	1.00	----	1.20	0.35	---	---		
Actual	0.40	0.74	----	1.02	0.25	0.021	0.016		RF 4212

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Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149.

T.C. -4/No: 4496/2

DATE: 12-04-2005.

CHEMICAL ANALYSIS CERTIFICATE

Customer: MAN TURBO AG Schweiz.

P.O. No. : 4004662, Dt.: 26-01-2005.

Project: KOSAIR 2004.

MAN Turbo Material Code: 10301918.

Drawing No.: 04443-00. Rev-C.

Coupling No.: 41496.

Heat No.: RF 4214 & RF 4207.

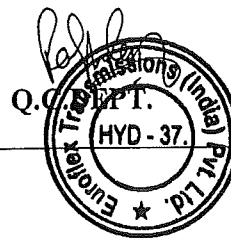
Description: SPACER & ADAPTORS.

Supplier TC Ref. No. : EU 436 / 04-05, Dt: 03-03-2005.

SPACER & ADAPTORS

Description	C%	Mn%	Ni%	Cr%	Mo%	S%	P%	Others%	Heat No.
Min.	0.36	0.60	----	----	---	----	---		
BS 970 080 M40									
Max.	0.44	1.00	----	----	---	----	---		
Actual	0.40	0.71	----	----	----	0.018	0.019		RF 4214
Actual	0.44	0.78	----	----	----	0.032	0.030		RF 4207

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Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.
Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C. -4/No: 4496/3

DATE: 12-04-2005.

CHEMICAL ANALYSIS CERTIFICATE

Customer: : MAN TURBO AG Schweiz.

P.O. No. : 4004662, Dt.: 26-01-2005.

Project: KOSAIR 2004.

MAN Turbo Material Code : 10301918.

Drawing No.: 04443-00. Rev-C.

Coupling No.: 41496.

Heat No.: B 39463 & B 40463.

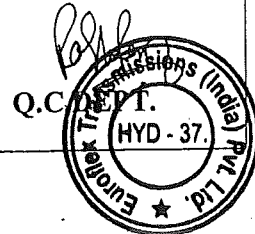
Description: COUPLING BOLTS, LOCK NUTS & ATTACHMENT BOLTS.

Supplier TC Ref No. : 2004004519, Dt.: 14-08-2004 & 2004008805, Dt.: 21-12-2004.

COUPLING BOLTS, LOCK NUTS & ATTACHMENT BOLTS

Description	C%	Mn%	Ni%	Cr%	Mo%	S%	P%	Others%	Heat No.
Min.	0.36	0.45	1.30	1.0	0.20	---	---		
BS 970 817 M40									
Max.	0.44	0.70	1.70	1.4	0.35	0.025	0.025		
Actual	0.42	0.57	1.34	1.19	0.22	0.016	0.009		B 39463
Actual	0.39	0.59	1.41	1.17	0.22	0.016	0.011		B 40463

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Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C. -4/No: 4496/3.

DATE: 12-04-2005.

CHEMICAL ANALYSIS CERTIFICATE

Customer : MAN TURBO AG Schweiz.

P.O. No. : 4004662, Dt.: 26-01-2005.

Project : KOSAIR 2004.

MAN Turbo Material Code : 10301918.

Drawing No.: 04443-00. Rev-C.

Coupling No.: 41496.

Heat No.: 072539.

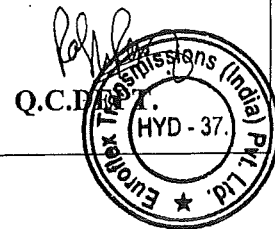
Description : FLEXING ELEMENTS

Supplier TC Ref No. 218759, Dt: 02-11-2004.

FLEXING ELEMENTS

Description	C%	Mn%	Si%	Ni%	Cr%	Mo%	P%	S%	Others%	Heat No.
Min.	----	----	----	6.00	16.0	----	---	---		
AISI 301.										
Max.	0.15	2.00	1.00	8.00	18.0	----	0.045	0.030		
Actual	0.108	0.97	0.46	7.33	16.74	0.28	0.027	0.002		072539

Q2
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QF/QC/21

TRANSMISSIONS (INDIA) PVT. LTD.

Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.
Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C. -5/No.5496/1.

DATE: 12-04-2005.

MECHANICAL ANALYSIS CERTIFICATE

Customer: **MAN TURBO AG Schweiz.**

P.O. No. : **4004662, Dt.: 26-01-2005.**

Project: **KOSAIR 2004.**

MAN Turbo Material Code : **10301918.**

Drawing No.: **04443-00. Rev-C.**

Coupling No.: **41496.**

Heat No.: **RF 4212.**

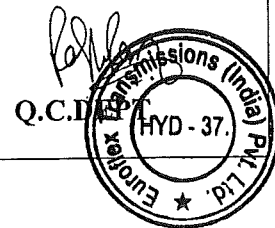
Description: **HUB.**

Mech. TC Ref No. : **3055 / 2005, Dt: 11-03-2005.**

HUB

	Hardness B.H.N.	Yield Point N./sq. mm	Tensile Strength N./sq. mm	Elongation % 5.65 $\sqrt{S_0}$	Impact "V" at R.T Joules	R.A. %	Heat No.
BS 970 709 M40 'T' Condition							
Standard	248 to 302	680 (Min)	850 - 1000	13 (Min)	50 (Min)		
Actual	285	809	908	18.16	92,98,96	58.66	RF 4212

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QF/QC/21

TRANSMISSIONS (INDIA) PVT. LTD.

Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.
Tel : 42379775, 42376970 Fax : 0091 - 40 - 42379523, 27847149,

T.C. -5/No.5496/2.

DATE: 12-04-2005.

MECHANICAL ANALYSIS CERTIFICATE

Customer: MAN TURBO AG Schweiz.

P.O. No. : 4004662, Dt.: 26-01-2005.

Project: KOSAIR 2004.

MAN Turbo Material Code : 10301918.

Drawing No.: 04443-00. Rev-C.

Coupling No.: 41496.

Heat No.: RF 4214 & RF 4207.

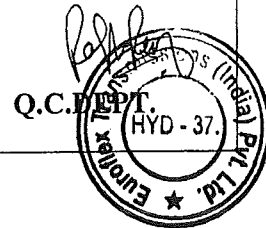
Description: SPACER & ADAPTORS.

Mech. TC Ref No. : 3055 / 2005, Dt: 11-03-2005 & 3130 / 2005, Dt: 30-03-2005.

SPACER & ADAPTORS

	Hardness B.H.N.	Yield Point N./sq. mm	Tensile Strength N./sq. mm	Elongation % 5.65 $\sqrt{S_0}$	Impact "V" at R.T Joules	R.A. %	Heat No
BS970 080 M40 'Q' Condition							
Standard	179 to 229	385 (Min)	625 - 775	16 (Min)	28 (Min)		
Actual	217	424	670	29.33	48,44,42	63.26	RF 4214
Actual	207	422	641	24.56	42,46,44	66.13	RF 4207

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TRANSMISSIONS (INDIA) PVT. LTD.

Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.
Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C. -5/No: 5496/3.

DATE: 12-04-2005.

MECHANICAL ANALYSIS CERTIFICATE

Customer: **MAN TURBO AG Schweiz.**

P.O. No. : **4004662, Dt.: 26-01-2005.**

Project: **KOSAIR 2004.**

MAN Turbo Material Code: **10301918.**

Drawing No.: **04443-00. Rev-C.**

Coupling No.: **41496.**

Heat No.: **B 39463 & B 40463.**

Description: **COUPLING BOLTS, LOCK NUTS & ATTACHMENT BOLTS.**

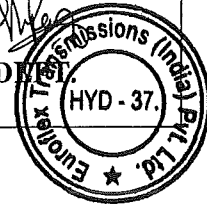
Mechanical TC Ref No: **3130 / 2005, Dt: 30-03-2005 & 1961 / 1 / 2005, Dt: 24-01-2005.**

COUPLING BOLTS, LOCK NUTS & ATTACHMENT BOLTS

	Hardness B.H.N.	Yield Point N./sq. mm	Tensile Strength N./sq. mm	Elongation % 5.65 $\sqrt{S_0}$	Impact "V" at R.T Joules	R.A. %	Heat No
BS970 817 M40							
'V' Condition							
Standard	293 to 352	850 (Min)	1000 - 1150	12 (Min)	42 (Min)		
Actual	341	945	1079	15.67	88,76,82	55.75	B 39463
Actual	331	943	1069	15.11	82,78,84	54.11	B 40463

INSPECTED BY

Q.C.DEP.



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TRANSMISSIONS (INDIA) PVT. LTD.
Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.
Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C. -5/No:5496/3

DATE : 12-04-2005.

MECHANICAL ANALYSIS CERTIFICATE

Customer.: MAN TURBO AG Schweiz.

P.O. No. : 4004662, Dt.: 26-01-2005.

Project: KOSAIR 2004.

MAN Turbo Material Code: 10301918.

Drawing No.: 04443-00. Rev-C.

Coupling No.: 41496.

Heat No.: 072539.

Description: ELEMENT BLADES.

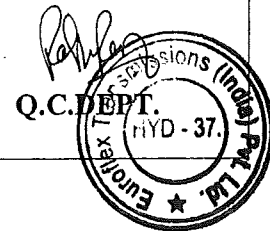
Supplier TC Ref No: 218759, Dt: 02-11-2004.

ELEMENT BLADES

	Hardness VPN	0.2% Proof Stress MPa	Tensile Strength MPa	Elongation %	Heat No.
AISI 301					
Actual	349	838	1066	26.00	072539

Note :- Certified that the above Mechanical Properties meet the requirements fully.

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QF/QC/22

TRANSMISSIONS (INDIA) PVT. LTD.

Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.
Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C.-6/NO.: 6496.

DATE: 12-04-2005.

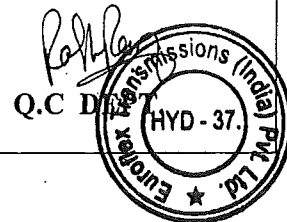
D P T CERTIFICATE

CUSTOMER : MAN TURBO AG Schweiz.
P.O. NO : 4004662, Dt.: 26-01-2005.
MATERIAL CODE : 10301918.
PROJECT : KOSAIR 2004.
DRG.NO : 04443-00. Rev-C.
COUPLING NO : 41496.
METHOD : COLOUR CONTRAST METHOD
TESTED TO SPEC. : ASTM E 165

S.NO,	DESCRIPTION	DRG.NO.	QTY	PENETRANT TIME (Minutes)	RESULT
1	MOTOR HUB RF 4212	04443-51	1	20	No surface defects observed
2	SPACER RF 4214	04443-61	1	20	No surface defects observed
3	ADAPTOR # 1 RF 4214	04443-71	1	20	No surface defects observed
4	ADAPTOR # 2 RF 4207	04443-72	1	20	No surface defects observed
5	ADAPTOR # 3 RF 4207	04443-73	1	20	No surface defects observed

INSPECTED BY

U.V. Soma Rao (Level II)



EUROFLEX

QF/QC/23

TRANSMISSIONS (INDIA) PVT. LTD.

Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.

Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C.-7/NO.: 7496.

DATE: 12-04-2005.

M P I CERTIFICATE

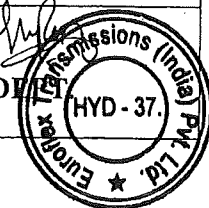
CUSTOMER : MAN TURBO AG Schweiz.
P.O. NO : 4004662, Dt.: 26-01-2005.
MATERIAL CODE : 10301918.
PROJECT : KOSAIR 2004.
DRG.NO : 04443-00. Rev-C.
COUPLING NO : 41496.
MACHINE MAKE : MAGNAFIELD
MODEL : 20-15 HW YF 07+DM 200
OUTPUT : 2000 AMPS
METHOD : WET METHOD WITH FLUORESCENCE.
TESTED TO SPEC. : ASTM E 709

S.NO,	DESCRIPTION	Qty.	AMPS Circular	AMPS Longitudinal	RESULT
1	COUPLING BOLTS H. No.- B 39463, (Drg. No. 10153330)	20	1500	6 KAT	No sub surface and surface cracks observed
2	ATTCH. BOLTS # 1 H. No.- B 40463, (Drg. No. 03500-27)	60	1500	6 KAT	No sub surface and surface cracks observed
3	ATTCH. BOLTS # 2 H. No.- B 40463, (Drg. No. 03500-28)	20	1500	6 KAT	No sub surface and surface cracks observed
4	LOCK NUTS H. No.- B 39463, (Drg. No. ETL-003) & H. No.- B 40463	100	1500	6 KAT	No sub surface and surface cracks observed

INSPECTED BY

U.V. Soma Rao (Level II)

Q.C DEPT



EUROFLEX

TRANSMISSIONS (INDIA) PVT. LTD.

Plot No. 99, Phase II, Gandhinagar, Hyderabad - 500 037, India.
Tel : 23079775, 23076970 Fax : 0091 - 40 - 23079523, 27847149,

T.C.9/NO. 9496.

DATE: 12-04-2005.

CERTIFICATE OF WEIGH MATCHING (BOLTS AND NUTS)

To:

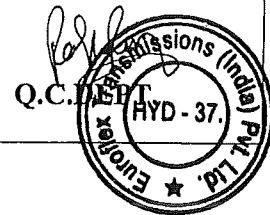
MAN TURBO AG Schweiz.
Schweiz, Hardstrasse 305,
CH - 8005. Zurich.

P.O.NO. : 4004662, Dt.: 26-01-2005.
PROJECT : KOSAIR 2004.
MATERIAL CODE: 10301918.
MODEL NO. : 10GBH-330-S.
DRAWING NO. : 04443-00. Rev-C.
COUPLING NO. : 41496.

It is hereby certified that the Bolts and nuts of the Coupling
(Item No. 3 & 6, 9 & 10, 13 & 14) have been weigh-matched. The maximum weight
difference between Bolt to bolt and nut to nut of the same class is 0.1 grams.

For Euroflex Transmissions (India) Pvt. Limited.

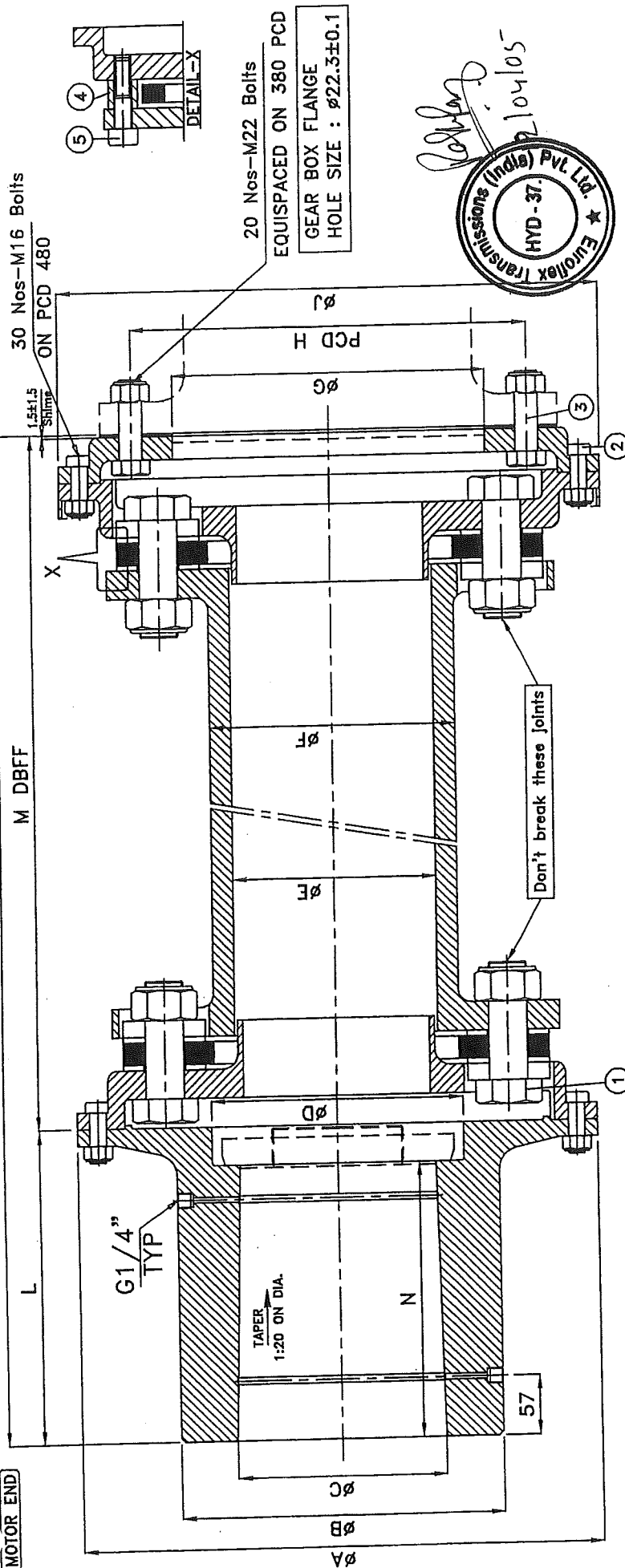

INSPECTED BY



GEARBOX END

K INCLUDING 1.5mm SHIMS)

(MOTOR END)



- Note:-
1. Tightening torque of bolts having threads lubricated with MOS2.
Item No: 2 Attachment bolt tightening torque = 220 Nm.
(Equiv to Bolt elongation of 0.11 mm)
Item No: 3 Attachment bolt tightening torque = 620 Nm.
(Equiv to Bolt elongation of 0.20 mm)
 2. Gaggling Screws & Bushes (Item No 4&5) are only for Transportation purpose and need to be removed prior to installation. Coupling not to operate with gaggling screws in position.
 3. For compressing transmission Unit to clear the spigot on the hubs, tighten gaggling screws (without bush in position)
 4. Do not disturb factory assembled Coupling bolts (Item No : 1).
 5. Refer curve-1 for misalignment capacity.

P.O. No. :- 4004662, Dt.: 26-01-2005.
Customer :- MAN TURBO AG.
Material :- 10301918.
Project :- KOSAIR 2004.
Model No. :- 10GBH-330-S.
Drawing No. :- 04443-00. Rev-C.
Coupling No. :- 41496.

Design Dim. (mm)	Measured Dim. (mm)	Remarks
ØA	500.10	
ØB	310.10	
ØC	199.50 ±0.015	199.49/199.50
ØD	241.00	
ØE	194.00	193.90
ØF	235.00	235.10
ØG	300.00 +0.000	300.01/300.00
PCD H	380.00	380.02
ØI	520.00	520.10
K	1098.00	1098.30
L	300.00	300.10
M	798.00	798.10
N	263.00	263.10

DIMENSIONAL INSPECTION REPORT

EUROFLEX TRANSMISSIONS (India) PRIVATE LIMITED

Plot No.99, C.I.L., Phase-II, Gandhinagar, Balanagar - Hyderabad - 500 037

ITPNO: QF/QC/14

QPNo: ETL/QP/2005/02

Rev: 0 Date: 29/01/2005

Quality Plan

(ISO QAP-4)

Customer: MAN Turbomaschinen AG Schweiz, Zurich.

Project: Kosair 2004.

Drawing No.: 04443-00 Rev-C

Model No.: 10GBH-330-S

P.O. No.: 4004662, Dt.: 26.01.2005

Coupling Sl. No.: 41496

Component	Operation	Type of Check	% Check	Standard / Acceptance	Agency	Remarks Norm
Hub / Adaptors	Chemical	Chemical	100%	BS 970 PART 1: 1983	ETL	Review by MANTURBO
	Mechanical	Mechanical	100%	BS 970 PART 1: 1983	ETL	
	N D T	U.T.	100%	ASTM A 388	ETL	
		DPT	100%	ASTM E 165	ETL	
	Dynamically	Balancing		API 671 Clause 2.6.3.5	ETL	
Spacers	Chemical	Chemical	100%	BS 970 PART 1: 1983	ETL	Review by MANTURBO
	Mechanical	Mechanical	100%	BS 970 PART 1: 1983	ETL	
	N D T	U.T.	100%	ASTM A 388	ETL	
		DPT	100%	ASTM E 165	ETL	
	Dynamically	Balancing		API 671 Clause 2.6.3.5	ETL	
Coupling Bolts & Lock nuts	Chemical	Chemical	100%	BS 970 PART 1: 1983	ETL	Review by MANTURBO
	Mechanical	Mechanical	100%	BS 970 PART 1: 1983	ETL	
	N D T	MPI	100%	ASTM E 709	ETL	
	Weigh Control	Weighing Check	100%	With In 0.1 gm	ETL	
Element assembly	Chemical	Chemical	100%	BS 970 PART 1: 1983	ETL	Review by MANTURBO
	Mechanical	Mechanical	100%	BS 970 PART 1: 1983	ETL	
Coupling Assembly	Inspection	Interface Dimensions	100%	Approved Drawing	ETL	Review by MANTURBO
	Dynamically	Unbalance		API 671 Clause 2.6.3.7	ETL	

• ETL = Euroflex Transmissions (India) Pvt. Limited

Issued By: - Quality Assurance Dept.

Prepared By: - SANKAR

Approved By: - KVMR

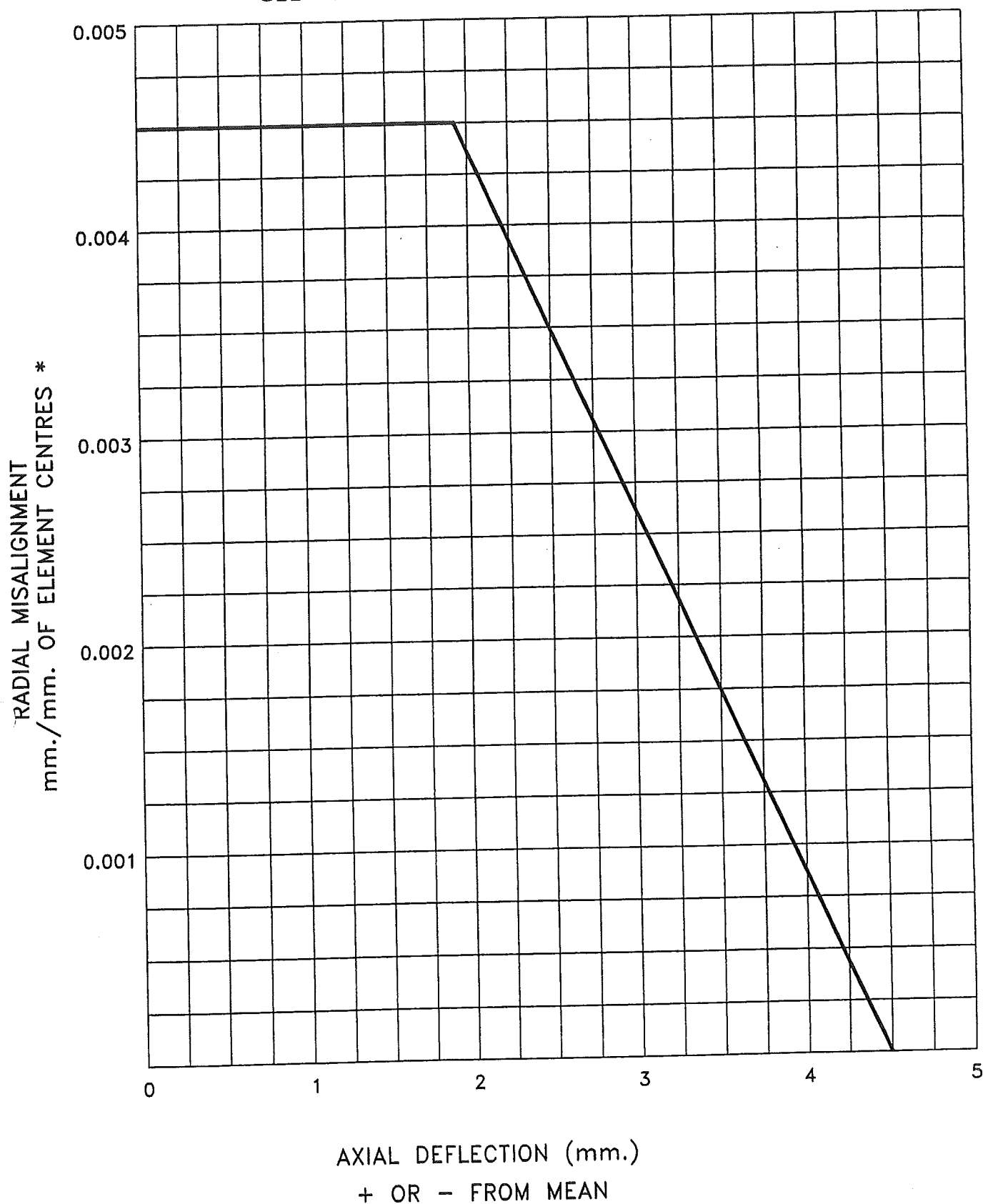
EUROFLEX TRANSMISSIONS [INDIA] PVT. LIMITED

COUPLING TYPE:-
10GBH-330-S

CURVE (1)
MISALIGNMENT VERSUS DEFLECTION

SPEED:-
1492 r.p.m

* FOR EQUIVALENT ANGULAR MISALIGNMENT
SEE CATALOGUE



EUROFLEX TRANSMISSIONS [INDIA] PVT. LIMITED

Zero 1492

DEFLN. [mm] (+/-)

AXIAL THRUST
VS
AXIAL DEFLN
(ESTIMATED)

10GBH-330-S

CURVE 2

AXIAL THRUST [N]

12500
12000
11500
11000
10500
10000
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500

COUPLING DATA SHEET API 671 THIRD EDITION S.I. UNITS				PAGE 1 of 2			
		JOB NO.		ITEM NO.			
		PURCH. ORDER NO.		DATE			
		INQUIRY NO.		DATE			
		REVISION		DATE			
1	NOTE : INFORMATION TO BE COMPLETED			☐ BY PURCHASER		☐ BY COUPLING MANUFACTURER	
2	APPLICABLE TO:			☐ PROPOSAL		☒ PURCHASE	
3	OWNER: MAN TURBO			NO. REQUIRED			
4	SITE Kosair 2004			SERVICE			
5	DRIVER MOTOR			MANUFACTURER		MODEL	
6	NAME PLATE POWER(KW)			SERVICE FACTOR		SERIAL NO.	
7	DRIVEN UNIT GEAR BOX			MANUFACTURER		MODEL	
8	SERIAL NO.			TAG NO.			
9	COUPLING TYPE ☒ FLEXIBLE ELEMENT			☐ GEAR		☐ QUILL SHAFT	
10	☒ MANUFACTURER EUROFLEX			MODEL 10GBH-330-S		SIZE	
11	☒ CONDITIONS CONSIDERED FOR COUPLING SELECTION			☒ RATINGS			
12	CONDITIONS			TORQUE(Nm)		@ RPM	
13							
14	NORMAL(2.1.1.3)			55047		1492	
15	DRIVEN RATED LOAD			PEAK			
16	MAXIMUM STEADY STATE(2.1.1.2.d)			MOMENTARY		335000	
17	MAXIMUM TRANSIENT(2.1.1.2d)						
18	TRIP CONDITION			SHAFT JUNCTURE			
19	CONTINUOUS CYCLIC(2.1.1.2d)			DRIVING (2.1.1.9)			
20	OTHER			DRIVEN (2.1.1.9)			
21	☐ FREQUENCY OF TRANSIENTS (EVENTS / TIME 2.1.1.8)			☐ NON SYNCHRONOUS EXCITING FREQUENCY 2.5.1.			
22	☒ COUPLING MINIMUM REQD. SERVICE FACTOR S.F.(2.1.1.4)(2.1.1.7)			1.75			
23	☐ AMBIENT TEMPERATURE (deg C)			MAXIMUM		MINIMUM	
24	ENVIRONMENT (2.7.3)(2.7.4)			☐ HYDROGEN CHLORIDE		☐ HYD. SULFIDE	
25				☐ OTHER			
26				LUBRICATION			
27	☐ CONTINUOUS(2.2.7)(2.2.8)			☐ BATCH(2.2.7)		☒ NON LUBRICATED	
28	☐ VISCOCITY(SSU)			@ deg C		☐ FILTRATION(MICRONS)	
29	☐ PRESSURE(Mpa)			☐ TEMPERATUR		deg C	
30				☐ FLOW (m3/h)			
31				COUPLING DATA			
32	☒ SHAFT SEPARATION (INCLUDING THERMAL GROWTH) (mm BSE)						
33	@AMBIENT TEMPERATURE (deg C)			@NORMAL OPERATION		794	
34				@MAXIMUM TRANSIENT			
35	☐ MOTOR ROTOR FLOAT (mm)			☐ LIMITED END FLOAT (mm)(2.2.3)			
36	☐ MARINE TYPE REQUIRED(2.2.2)			☐ FLEXI HUB TYPE REQUIRED(2.2.2)		☐ ELECTRICALLY INSULATED(2.1.12)	
37	☐ REQUIRED MISALIGNMENT CAPABILITY(2.1.1.6)						
38	STEADY STATE:			ANGULAR(DEG)		PARALLEL OFFSET(mm)	
39	TRANSIENT:			ANGULAR(DEG)		PARALLEL OFFSET(mm)	
40	MAXIMUM ALLOWABLE MISALIGNMENT (5.2.2.3.q)						
41	STEADY STATE:			ANGULAR(DEG)		0.25	
42	TRANSIENT:			ANGULAR(DEG)		0.313	
43	PARALLEL OFFSET(mm)			2.5		AXIAL(mm)	
44	PARALLEL OFFSET(mm)			3.13		AXIAL(mm)	
45	AXIAL(mm)			4.5		5.63	
46	☐ COMPONENT BALANCING(2.6.2.1)(2.6.3.5) OR			☐ COMPONENT BALANCE WITH ASSY. CHECK BALANCE(2.6.2.2)(2.6.3.6) or			
47	☒ OR COMPONENT BALANCE WITH ASSY. BALANCE(2.6.2.3)(2.6.3.7)						
48	☐ RESIDUAL UNBALANCE CHECK OF ASSEMBLED COUPLING(2.6.3.8)			☐ BALANCE REPEATABILITY CHECK (2.6.3.9)			
49	MAXIMUM ALLOWABLE RESIDUAL UNBALANCE(gm-mm)(2.6)			DRIVER END		1123.6	
50	MAXIMUM ACTUAL RESIDUAL UNBALANCE(gm-mm)(2.6)			DRIVEN END		736.3	
51	TORSIONAL STIFFNESS MNm/Rad(5.2.2.3)			16			
52	WR2(Kg-mm2)(5.2.2.3i)			DRIVER END		5.175x10 ⁶	
53				DRIVEN END		4.025x10 ⁶	
54	SPACER LATERAL NATURAL FREQUENCY CPM (2.5.2)(5.2.2.3k)			95000 Cyl/Min			
55	TORQUE CAPACITY OF HUB/SHAFT INTERFACE FOR KEYLESS FITS(Nm)(5.2.2.3i)			N.A.			
56	C SURESH SANKAR KVMR			 EUROFLEX TRANSMISSIONS (INDIA) PVT. LIMITED 99, C.I.E., Phase-II, Gandhinagar, Balanagar Hyderabad 500037, India Email: euroflex@satyam.net.in Tel 23076970, 23079775 Fax: 0091-40-23079523, 27847149		Date	
57	B SURESH SANKAR KVMR					12-Mar-05	
58	A SURESH SANKAR KVMR						
59	Prepared Checked Approved						

COUPLING DATA SHEET
API 671 THIRD EDITION
S.I. UNITS

PAGE 2 off 2

JOB NO.	ITEM NO.
PURCH.ORDER NO.	DATE
INQUIRY NO.	DATE
REVISION	DATE

COUPLING DATA (CONTINUED)

1			
2	FLEXIBLE ELEMENT COUPLING		
3	☐ INITIAL DEFLECTION(mm) NA	☐ PRESTRETCH NA	☐ COMPRESSION - ☐ MAXIMUM AXIAL DEFLECTION
4	☐ CALCULATED AXIAL NATURAL FREQUENCY(5.2.2.3h)	☐ TEST OF ANF(4.4.1) - N.A.	☐ ACTUAL ANF
5	☐ MAXIMUM ENCLOSURE TEMP. AT MAX. CONTINUOUS SPEED (deg C)(5.2.3.3)		
6	MATERIALS(2.7)		
7		DRIVE END MATERIALS	DRIVEN END MATERIALS
8	HUB/FLANGE	BS970 709 M40	BS970 080 M40
9	SPACER	BS970 080 M40	BS970 080 M40
10	SLEEVE	NA	NA
11	FLEXIBLE ELEMENT	AISI 301	AISI 301
12	FLEXIBLE ELEMENT GUARD	NA	NA
13	BOLTS	BS970 817 M40	BS970 817 M40
14	NUTS	BS970 817 M40	BS970 817 M40
15	☐ PROTECTIVE COATING(2.7.6)	☒ VENDOR STANDARD	
16	☐ INTERNAL TEETH HARDNESS(ROCKWELL C 2.2.6)	DRIVE END ACTUAL	DRIVEN END ACTUAL
	☐ EXTERNAL TEETH HARDNESS(ROCKWELL C 2.2.6)	DRIVE END ACTUAL	DRIVEN END ACTUAL

COUPLING HUB MACHINING

19		DRIVE END	DRIVEN END
20	☒ TYPE INTEGRAL,CYLINDRICAL,TAPER(2.1.14)(2.1.8.1)	TAPER	INTEGRAL
21	☒ KEYED OR HYDRAULICALLY FITTED(2.1.8.1)	HYDRAULIC	20-M22-380PCD
22	☒ TAPER(1 DEG.1.A.,1/2 IN. PER FT.,3/4 IN. PER FT.)	1:20	NA
23	(2.1.9.1.1)(2.1.9.1.2)(2.1.9.1.3)		
24	☐ KEYWAY DIMENSION & NUMBER(2.1.9.2)	NA	NA
25	☒ NOMINAL BORE DIAMETER	Ø200	Ø300
26	☐ INTERFERENCE FIT(mm, MAX/MIN,2.1.8.1)	-	-
27	☒ PULLER HOLES(2.1.9.2.4)	-	YES
28	☒ TRIM BALANCE HOLES(2.6.4)	YES	YES

COUPLING GUARD (APPENDIX D)

29			☐ PURGE GAS	☐ DRY AIR PURGE(D.4.4)
30	☐ CO-ORDINATOR(D.2.1.)	☐ BASE MOUNT(D.3)	☐ PURGE CONNECTION SIZE & TYPE	
31	☐ FLANGED & CYLINDRICAL(D.4)	☐ OIL TIGHT(D.2.7)	☐ PURGE m3/h REQUIRED	
32	☐ AIR TIGHT(D.6.2)		OIL MIST COOLING	GAS COOLING
33	☐ SPARK RESISTANT(D2.9)		☐ CONTRACT GUARD TO BE USED DURING SHOP TEST(D.4.5)	
34	☐ TRANSPERENT WINDOW FOR EACH SPRAY POINT(D.5.5)		☐ ADDITIONAL GUARD DETAILS(2.3.3)	
35	☐ VENT CONNECTION(D.4.3.)			
	☐ 1 INCH FLANGED, RATING & FACING			
	☐ 1 INCH NPT WITH FILTER BREATHER			

ACCESSORIES

38			
39			
40	☐ PRIME EQUIPMENT SUPPLIER TO FURNISH ONE SET OF PLUG	☐ HYDRAULIC INSTALLATION/REMOVAL TOOLING (TO INCLUDE	
41	AND RING GAUGES(3.5)	HAND PUMPS , PR. GAUGES & FITTINGS AND HOSES BY 3.1	
42	☐ DRILL TEMPLATE FOR INTEGRAL FLANGED HUBS BY (2.1.5.1)	☐ PURHASER	☐ COUPLING MANUFACTURER
43	☐ COUPLING MANUFACTURER	☐ PURHASER	☐ PULLER BY COUPLING MANUFACTURER(3.4)
44	☐ TWO PIECES STOP RINGS BY COUPLING MANUFACTURER(3.3)	☐ MOMENT SIMULATOR (2.1.6)	☐ SOLOPLATE(2.1.7)

APPLICABLE SPECIFICATIONS

45		PREPARATION FOR SHIPMENT
46	☐ API 671 SPECIAL PURPOSE COUPLINGS	☐ OUT DOOR STORAGE FOR MORE THAN 3 MONTHS(4.5.2)
47	☐	☐ EXPECTED STORAGE TIME
48		☐ SHIPPING ☐ DOMESTIC ☐ STORAGE ☐ INDOOR
49		(4.5.3) ☐ EXPORT 4.5.2 ☐ OUTDOOR
50		☐ SEE COUPLING PURCHASE ORDER FOR PRESERVATION.
51		BOXING AND SHIPPING INSTRUCTIONS
52	☐ CO-ORDINATION MEETING ATTENDANCE REQUIRED(5.1.3)	

C	SURESH	SANKAR	KVMR	 EUROFLEX TRANSMISSIONS (INDIA) PVT. LIMITED 99, C.I.E., Phase-II, Gandhinagar, Balanagar Hyderabad 500037, India Email: euroflex@satyam.net.in Tel 23076970. 23079775 Fax: 0091-40-23079523.27847149	Date
B	SURESH	SANKAR	KVMR		12-Mar-05
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	Prepared	Checked	Approved		