

Technical Bulletin

HOW TO USE DESIGN FLEX[®] PRO[™]

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HOW TO USE DESIGN FLEX[®] PRO[™]

Design Flex[®] Pro[™] is a belt drive selection tool for design engineers, maintenance engineers, and power transmission distributors.

In this technical bulletin the following Design Flex[®] Pro[™] topics will be covered:

- > Designing a new belt drive
- > Checking a current drive design for capacity and tensioning information
- > Suggested options for an application
- > Drive detail report explanation
- > Design Flex[®] Pro[™] troubleshooting

In addition to designing belt drives, Design Flex[®] Pro[™] may be used to:

- > Determine proper belt installation tension
- > Calculate belt pull
- > Determine the belt power transmission capacity
- > Estimate the energy savings of a synchronous belt drive compared to a V-belt drive
- > Estimate the cost saving of replacing roller chain with a Poly Chain[®] GT[®] belt drive

The features of Design Flex[®] Pro[™] are explored in detail below. Miscellaneous user tips are also provided.

NEW DRIVE DESIGN – DESIGNING A BELT DRIVE

When designing a belt drive using Design Flex[®] Pro[™] there is both mandatory and optional information inputs. The screen shot below shows the necessary information.

Required Information for Drive Design:

- 1. Desired belt type
- 2. Motor Power and RPM
- 3. Motor Frame & Gearbox information (if belt drive will be located on the output shaft of a gearbox)
- 4. Service Factor
- 5. Desired DriveN pulley RPM (Nominal) or Speed Ratio
- 6. Center Distance between shafts (Nominal)

Optional

7 & 8. Restrictions



A. Click on the **Design** button to view the possible drive configurations and report.

User Tips:

> Multiple belt type options: Checking more than one belt type or section (e.g. SPB) box will provide solutions for each of these if suitable designs exist to meet the input criteria.

> Motor power drop-down box: Select a standard motor power and then use the Motor Frame dropdown box to have the driver shaft diameter and length automatically entered. > Drive Service Factor help button: This assists in assigning a service factor based on drive characteristics and the hours of service per day.

> Motor efficiency: This value is used as part of the energy saving calculations of a synchronous belt drive compared to a V-belt drive.

> Shaft diameters: Although they aren't required to find possible drive solutions, knowing the shaft diameters can often be very useful. This is because you need to make sure the pulleys/sprockets used in the design can accommodate these shaft sizes.

> Can't find the belt type or cross section you're after? You may need to change between our product markets, Europe or North America. To alternate between them click on Tools > Options and then select the appropriate product market.

Example:

After entering the below information into the main input screen and clicking the **Design** button we get the following Solution Summary.

Belt Type: 8MGT Poly Chain GT Carbon Motor Power & RPM: 22kW @ 1500rpm Service Factor: 1.6 Required DriveN Speed: 2000rpm DriveN, Max O.D.: 100mm Centre Distance: 800mm

🐔 Design Fle	x® P	ro Solution Summa	ry, Design #1, Ve	r. 2.06/2.00/2.0	03/ Dyn Euro	pe			0				
File Opti	ons	Help											
🕴 🍓 Print 👻	×	lose											
Show Solution	s con	taining:											
Non-Stock	Item - rives -	- 2 - 7	*										
Synchronous													
Selected	!	Prod Line	Belt	DriveR (Grooves)	DriveN (Grooves)	dN RPM	Δ RPM	ODR	Rel. Cost ▲	CD (mm)	∆ CD (mm)	Belt Pull (kg)	Width (mm)
		Poly Chain Carbon	8MGTC-1792-36	34	25	2,040.0	40	1.0	1.0	778	-22	424	46
		Poly Chain Carbon	8MGTC-1792-36	36	28	1,928.6	-71	1.1	1.1	768	-32	401	46
		Poly Chain Carbon	8MGTC-1792-36	38	28	2,035.7	36	1.2	1.1	764	-36	380	46
		Poly Chain Carbon	8MGTC-2000-36	40	30	2,000.0	0	1.3	1.2	860	60	361	46
		Poly Chain Carbon	8MGTC-2000-36	45	34	1,985.3	-15	1.6	1.2	842	42	320	46
Synchronou	s : 5 S	olutions											

Design Flex[®] Pro[™] has found 5 drive options which meet the input parameters. The above results are in order of relative cost as signified by the red triangle in the column heading. You can click on other column headings to sort the results by that column value, increasing or decreasing (triangle points up for increasing and down for decreasing).

Double-click on a row to display the Drive Detail Report for that drive configuration.

DriveR (teeth) & DriveN (teeth): Size of sprockets (pulleys for V-belt drives).

DN RPM: DriveN Speed for this drive configuration.

 Δ **RPM:** Difference in RPM between the requested DN speed and actual.

ODR: Over Design Ratio provides a quick reference to how the Rated Power of the drive compares to what is actually required. An ODR of 1 provides the most efficient and cost effective solution.

Rel. Cost: Comparison of drive costs.

CD: Centre Distance of the drive.

 Δ CD: Difference in CD between the requested CD and actual.

Belt Pull: Dynamic Shaft Load minus pulley weights.

Width: Maximum width of sprocket/pulleys.

Note: If you have both a V-belt and synchronous belt type selected you will see two tabs on the Solution Summary Screen.

Synchronous	V-Be	ts 🚽		
Selected	!	Prod Line	Belt	DriveF (Groov
		Poly Chain Carbon	8MGTC-1792-36	3

DESIGN FOR CAPACITY AND TENSIONING INFORMATION

CHECKING A CURRENT DRIVE

The below screen shot shows the following drive details after being entered in:

Current Drive Example:

Belts: 6x SPA2360 Gates Super HC Motor Power & RPM: 30kW @ 1440rpm Service Factor: 1.3

Required Information for Drive Design:

- 1. Select Current Belt Cross Section or Profile
- 2. Select Current Belt Length
- 3. Select Enter the Current No or width of Belts
- 4. Select Enter the Current Input/Motor Conditions
- 5. Enter desired Service Factor
- 6. Select Enter the DriveR Pulley Size
- 7. Select Enter the DriveN Pulley Size

Optional

- 8. Enter the DriveR Shaft Size
- 9. Enter the DriveR Shaft Size)

DriveR: SPA150/6 Pulley DriveN: SPA300/6 Pulley



User Tips:

> Drive width: If the Width drop-down box doesn't have the number of belts (or width of synchronous belt) you need then simply type in the required value. This also applies to motor power, speeds and pulley sizes.

A. Click on the **Design** button to view the following Drive Detail Report screen.

e View Options					
00% 🔹					
Close	Suizz	Industrial Belt De	sign - Driv	e Detail Re	port
Close All		5	,	•	
Customer Information	Designed For:		Provided By:		
nits of Measure					
Print	Application: De	sign #1			
Print To File	INPUT Driv Known Belt: Sup Speed Paties: 2.00	ve Information per HC - SPA2360 - 6 0. Down	Known Size:	DriveR 150 mm Datum	DriveN 300 mm Datum
Next Shorter Belt	Input Load: 30 I Service Factor: 1.3	kW, Efficiency: 93.00 %	Maximum Rim Speed:	33 m/s	33 m/s
Next Longer Belt	Design Power: 39 I Center Distance: 823	kW (25000 h) 3.2 mm	Bushings Checked: Belts Checked:	TL Super HC	
lext Narrower Belt				Single Belts, Po	owerBand, Electric Motor
Neud Medeo Della	SELECTED DRIVE		5.1	D. L. D	D.I. I
Next Wider Beit	Beit Type: Su	Total # of Strands/Ribs:	6 Belt	DriveR	DriveN
	Speed Ratio: 2.0	00 Down Part No:	6-SPA2360	150 mm Datum	300 mm Datum
	dN RPM: 72	0.0 Product No:	9333-02360	Non-Stock Item	Non-Stock Item
	Rated Load: 39, Belt Pull: 41	36 N Veight:	19.kg	_	-
	Center Distance: 823	3.2 mm Rim/Belt Speed:	11.3 m/s	11.3 m/s	11.3 m/s
	Install/Take-Up Range: 798	8.2 mm to 863.2 mm RPM:	287.5	1440.0	720.0
		Bushing Part No:		-	-
		Bore:		450.0	-
		Pitch Diameter:		150.0 mm	300.0 mm
	TENSION	New Belt Us	ed Belt		
	Rib/Strand Deflection D Rib/Strand Deflectio	Distance: 8.20 mm 8. on Force: 2.0 to 2.1 kg 1.7	20 mm to 1.9 kg		
	Sonic Tensic	on Meter			
	00110 16130				

Buttons on the left of the Drive Detail Report screen:

- > Close: Returns to solution summary screen.
- > Close All: Returns to main entry screen.

> Customer Information: Allows for entry of customer details to be shown at the top left corner of the report.

> Units of Measure: Allows adjustment of the units shown on the report, E.g. change Deflection Force from Newtons (N) to kilograms (kg).

> **Print:** Print the report

> Print to File: Saves the report as a PDF file.

> Shorter Belt and Longer Belt: Modifies the detail report to reflect belt lengths in addition to the length selected by Design Flex[®] Pro[™]. The drive may not meet the original center distance or capacity requirements.

> Narrower Belt and Wider Belt: Modifies the detail report for widths other than that which Design Flex[®] Pro[™] has selected. The alternate drives will have less or more than the requested capacity.

> Print to File: Saves Drive Detail Reports or Solution Summaries in PDF format.

Note:

If you enter in an existing drive and its under or over designed a variation of the Solution Summary screen will be displayed. In these instances there will be two tabs displayed labelled Recommended Solution and Entered Drive.

> Recommended Drive Tab: This shows the recommended number of belts/belt width for this load, belt (type and length) and pulley combination. This may still be overdesigned so review the notes before finalising your selection. Double-click on the drive option to show its Drive Detail Report.

Sec. 1	Recomme	Recommended Solution Entered Drive												
	Selected	!	Prod Line	Belt	DriveR (mm)	DriveN (mm)	dN RPM	Δ RPM	ODR	Rel. Cost ▲	CD (mm)	∆ CD (mm)	Belt Pull (kg)	Width (mm)
I			Super HC	6-SPA2360	150	300	720.0	0	1.0	1.0	823	0	422	N/A

> Entered Drive Tab: This shows the drive details based on your inputs. Double-click on the drive option to show its Drive Detail Report.

Recomme	ende	Recommended Solution Entered Drive													
Selected	!	Prod Line	Belt	DriveR (mm)	DriveN (mm)	dN RPM	Δ RPM	ODR	Rel. Cost ▲	CD (mm)	∆ CD (mm)	Belt Pull (kg)	Width (mm)		
		Super HC	3-SPA2360	SPA 150.00	SPA 300.00	720.0	0	0.5	1.0	823	0	422	44		

User Tips:

> Saving drive detail reports in PDF format (Print to File) is very useful for storing and/or emailing them to customers. Using relevant file names makes finding them easier in the future.

> To speed up naming the PDF files click on the Customer Information button and copy (CTRL-C) the Application Title text. Now click on Print to File button and paste (CTRL-V) this text into the File Name field. This also keeps the file name and Application Title consistent.

Customer Information		×
Application Title:	Design #1	
First/Last Name:		Save
EMail Address:		Cancel



SUGGESTED OPTIONS FOR AN APPLICATION

The below screen shot shows the following application details after being entered in:

Application Example:

Application: Pump Motor Power & RPM: 55kW @ 1465rpm Centre Distance: 1200mm DriveR Shaft Diameter: 40mm Environment: Clean, minimal dirt/dust

Required Information for Drive Design:

- 1. Select One/ Multiple Belt Cross Sections or Profiles
- 2. Select/ Enter the Current Input/Motor Conditions
- 3. Enter desired Service Factors (V-& Synch Belts)
- 4. Enter DriveN Speed or Ratio
- 5. Enter Centre Distance

Optional

- 6. Enter the DriveR Shaft Size
- 7. Enter the DriveR Shaft Size

A. Click on the Design button

23 T Design Flex® Pro, Design #1, Ver. 2.06/2.00/2.03/ Dyn Europe File Drive Options Tools Help sired Belt Line Application Title: 1 🚺 Design Poly Chain Carbon Δ Design #1 --- 🗹 8M Set Savings Numbers 🗄 - 📃 Poly Chain GT2 Design PowerGrip GT3 Flex . PowerGrip HTD € CTB Clear V 🖶 🔳 QuadPower III ere for information on QuadPower III XPA N 4 Unspecified Length N Pulley Speed Min. RPM 2160 DriveR Pulley Width Unspecified - 4 % Shaft Dia. 45 6 mm Nominal RPM 2250 +1- 4 • Shaft Len Unspecified mm Max. RPM 2340 2 + 4 Max. O.D. Unspecified mm Speed Ratio 1.54 Speed Up Unspecified Max. Width mm -Motor Distance Between Sha Electric Motor 🔽 VFD / Soft Start Unspecified -5 Min. CD 1080 10 3 3-Phase Nominal CD 1200 +/- 10 % Power 55 kW • Max. CD 1320 2 + 10 % Motor Eff. DriveN Pulley mm RPM 1465 -92 Shaft Dia. 35 mm 7 Bushings to Consider Motor Frame Unspecified 100 Gearbox Speed Ratio 1 Shaft Len Unspecified mm ▼ Taper-Lock Max. O.D. Unspecified mm -MPB/ BTS Output RPM 1465 Max. Width Unspecified mm -Drive Service Factor Unspecified 💌 3 V-Belts Synchrono us Help 1.3 1.6 Maximum allowable 33 m/s rim speed

Belts: V-Belt (XPA) or Synchronous (8MGT Carbon) Required DriveN Speed: 2250rpm Service Factor: 1.3 (V-belt) & 1.6 (Synch) DriveN Shaft Diameter: 35mm

Solution Summery Screen - Note there is a tab for Synchronous & V-belt solutions

🎢 Design I	Flex® Pi	ro Solution Summa	ry, Design #1, Ve	r. 2.06/2.00/2.	03/ Dyn Euro	pe							
File Op	ptions	Help											
🕴 🍓 Print 🔸	- <mark>X</mark> c	lose											
Show Soluti	ions cont	aining:											
Non-Stor	ck Item - n Drives -	3 - 23	*										
Synchro	nous	V-Belts											
Selected	!	Prod Line	Belt	DriveR (Grooves)	DriveN (Grooves)	dN RPM	Δ RPM	ODR	Rel. Cost ▲	CD (mm)	∆ CD (mm)	Belt Pull (kg)	Width (mm)
		Poly Chain Carbon	8MGTC-2800-36	60	40	2,197.5	-52	1.0	1.0	1,200	0	615	46
		Poly Chain Carbon	8MGTC-3200-21	112	75	2,187.7	-62	1.2	1.0	1,225	25	330	31
		Poly Chain Carbon	8MGTC-2840-36	75	48	2,289.1	39	1.3	1.1	1,173	-27	492	46
		Poly Chain Carbon	8MGTC-2840-36	75	50	2,197.5	-53	1.3	1.1	1,170	-30	492	46
		Poly Chain Carbon	8MGTC-3048-36	90	60	2,197.5	-53	1.6	1.3	1,223	23	410	46
Synchron	ous : 5 S	olutions V-Belts	: 7 Solutions										.::

Click the tab to show the options

🖌 Design	Flex® P	ro Solution Sur	mmary, Desi	gn #1, Ver. 2	2.06/2.00/2.0	3/Dyn E	urope							- 0 X
File O	ptions	Help												
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Show Solut	tions con	taining:												
Problem Drives - 23														
Synchro	onous	V-Belts												
Selected	!	Prod Line	Belt	DriveR (mm)	DriveN (mm)	dN RPM	Δ RPM	ODR	Rel. Cost ▲	CD (mm)	∆ CD (mm)	Belt Pull (kg)	Width (mm)	
		QuadPower III	3-XPA3150	SPA 315.00	SPA 200.00	2,307.4	57	1.0	1.0	1,169	-31	356	44	-
		QuadPower III	3-XPA3150	SPA 315.00	SPA 212.00	2,176.8	-73	1.1	1.0	1,160	-40	355	44	
		QuadPower III	4-XPA3000	SPA 250.00	SPA 160.00	2,289.1	39	1.0	1.1	1,177	-23	446	57	
		QuadPower III	5-XPA3000	SPA 200.00	SPA 132.00	2,219.7	-30	1.0	1.1	1,239	39	555	70	
		QuadPower III	3-XPA3350	SPA 355.00	SPA 224.00	2,321.8	72	1.2	1.1	1,218	18	316	44	
		QuadPower III	5-XPA3000	SPA 212.00	SPA 140.00	2,218.4	-32	1.0	1.2	1,223	23	524	70	
		QuadPower III	6-XPA2800	SPA 180.00	SPA 118.00	2,234.7	-15	1.0	1.2	1,166	-34	616	83	
Synchron	nous : 5 S	Solutions V-E	Belts : 7 Solut	tions										

You can choose to print a number of selections by clicking on the white box next to the options that seem suitable. You then click on the Print button and print either the Selected Drives or All Drives. Below is the resulting Summary Report page for All Drives.

		Applic	For:	Desi	ign #'	1			Pı	ovide	d By:	Phillip Gates 1-15 H Dande Austra paitke 03 97	Aitker Austra Hydrive anong alia n@gat 97 964	alia Close South, tes.cor 3 Pho	e , Victor m ne	ria 317:	5	
PUT Desigr	S S n Pow Cent	Speed F Input I .F. (VB ver (VB ter Dist	Ratio: Load: /SB): /SB): ance:	Drive 1.54 55 kV 1.30 95.88 1200	/ Infor Up //, Effic / 1.60 3 kW / mm +;	rmatior ciency: 9 118.01 k /-10%	1 2.00 % W		Maxim Bus	num Rin Shaft D shings C Belts C	RPM n Speed Diameter Checked Checked	: : : TL : Poly	Dr 14 33 45 / Chair S	iveR 65.0 m/s mm Carbo	on, Qu Belts, F	2 adPow PowerB	Driv 2250.0 33 r 35 r ver III 3and, E	r eN +/-4% n/s nm
7 V an	d 5 S	ync sol	utions	s were	found.	Sorte	d by Rel.	Cost. All solution	ns printe	d.		_			,			
D	rive	R	<u> </u>	Dri	iveN			Belt	Cei	nter D)ist.	Ten	ision	ing	Belt	Over		
Tth/	Dia	Duch	Tth/	Dia	Durch	DDM	Prod	Part Number	Ideal (mm)	Inst.	Takeup	Defl.	New	Used (kg)	Pull:	Des.	Rel.	Notor
60 1	152.8	2517	40	101.9	2012	2197.5	PCC	8MGTC-2800-36	1199.7	1162.4	1201.0	18.74	23	18	6034	0.96	1.0	1
112 2	285.2	2517	75	191.0	2517	2187.7	PCC	8MGTC-3200-21	1225.1	1199.2	1226.4	19.13	13	9.7	3232	1.22	1.0	
75 1	191.0	3020	48	122.2	2012	2289.1	PCC	8MGTC-2840-36	1173.5	1136.2	1174.8	18.33	19	15	4827	1.26	1.1	
75 1	191.0	3020	50	127.3	2012	2197.5	PCC	8MGTC-2840-36	1169.6	1132.2	1170.8	18.27	19	15	4827	1.28	1.1	
90 2	215.0	3020	60	200.0	2517	2197.5	ORIII	2 YPA2160	1223.4	1197.5	1224.7	19,11	2.6	13	4022	1.61	1.3	2
3	315.0	3020		212.0	2517	2176.8	QPIII	3-XPA3150	1160.0	1135.0	1205.0	11.59	3.5	3.1	3480	1.05	1.0	
2	250.0	3020		160.0	2517	2289.1	QPIII	4-XPA3000	1177.1	1152.1	1222.1	11.76	3.3	2.8	4373	1.03	1.1	
-	200.0	3020		132.0	2517	2219.7	QPIII	5-XPA3000	1238.8	1213.8	1283.8	12.38	3.2	2.8	5441	0.97	1.1	1
2	APP O	3020		224.0	2517	2321.8	QPIII	3-XPA3350	1218.5	1193.5	1263.5	12.17	3.2	2.8	3100	1.19	1.1	
3	\$55.0	2020		140	2517	2218.4	QPIII	5-XPA3000	1223.0	1198.0	1268.0	12.22	3.0	2.6	5138	1.05	1.2	
3	212.0	3020									a data da ser							
	PUT Desig 7 V an D Tth/ Grv 60 2 75 75 90 2	PUT S Design Pow Cent 7 V and 5 S Drive Thv Dia Grv (mm) 60 152.8 112 285.2 75 191.0 90 229.2 315.0 315.0 345.0	Applic: PUT Speed F Input I S.F. (VB Design Power (VB Center Dista 7 V and 5 Sync sol DriveR Tth/ Dia Grv (mm) Bush 60 152.8 2517 112 285.2 2517 112 285.2 2517 112 285.2 2517 112 285.2 2517 111 2020 275 191.0 3020 90 229.2 3020 315.0 3020 315.0 3020 315.0 3020	Application: PUT Speed Ratio: Input Load: S.F. (VB/SB): Design Power (VB/SB): Center Distance: 7 V and 5 Sync solutions DriveR Tth/ Dia 0152.8 2517 40 112 285.2 2517 75 75 191.0 3020 48 75 191.0 3020 48 75 191.0 3020 60 315.0 3020 315.0 3020	Application: Design PUT Drive Speed Ratic: 1.54 Input Load: 55 kV S.F. (VB/SB): 1.30. Design Power (VB/SB): 95.85 Center Distance: 1200 7 V and 5 Sync solutions were DriveR DriveR Dri 112 285.2 2517 100 152.8 2517 112 285.2 2517 112 285.2 2517 115 3020 50 127 191.0 3020 50 1315.0 3020 200.0 315.0 3020 220.0	Application: Design # PUT Drive Info Speed Ratio: 1.54 Up Input Load: 55 kW, Effic S.F. (VB/SB): 1.30 / 1.60 Design Power (VB/SB): 9.58 kW / Center Distance: 1200 mm + 7 V and 5 Sync solutions were found. Drive N Thv Dia Grv (mm) Bush Grv (mm) Bush 60 152.8 2517 101.9 2012 112 285.2 2517 191.0 2517 75 191.0 3020 50 122.7 3012 180 229.2 3020 60 152.8 2517 191.0 3020 50 127.3 2012 101.9 2012 2012 190 3020 50 127.3 2012 1315.0 3020 201.0 2517 315.0 3020 201.0 2517 1315.0 3020 212.0 212	Application: Design #1 PUT Drive Information Speed Ratic: Dispeed Ratic: 1.54 Up Input Load: 5 KW, Efficiency: 9 S.F. (VB/SB): 1.30 / 1.60 Design Power (VB/SB): 9.88 kW / 118.01 k Center Distance: 1200 mm +/-10% 7 V and 5 Sync solutions were found. Sorter <u>DriveR</u> <u>DriveN</u> Thv Dis 7517 v287 01 152.8 2517 40 101.9 2012 2187.5 112 285.2 2517 75 191.0 2517 2187.7 75 191.0 3020 46 122.8 2012 2181.5 190 228-2 3020 60 152.8 2517 2187.7 191.0 3020 50 127.3 2012 2288.1 191.0 3020 120.0 2517 2187.7 139.0 3020 191.0 3020 120.0 2517 2187.7 139.4 191.0 3020 120.0 2517 2187.4 139.4 191.0 3020 120.0 2517 2187.4 139.4 192.9 3020 120.0 2517 2177.4 139.4	Application: Design #1 PUT Drive Information Speed Ratic: 1.54 Up Input Load: 55 kW, Efficiency: 92.00 % S.F. (VB/SB): Design Power (VB/SB): 9.58 kW /118.01 kW Center Distance: 1200 mm +/-10% 7 V and 5 Sync solutions were found. Sorted by Rel. Thv Dia Grv (mm) Thv Dia Str 7 V and 5 Sync solutions were found. Sorted by Rel. Thv Dia Grv (mm) Thv Dia Str 7 V and 5 Sync solutions were found. Sorted by Rel. Thv Dia Grv (mm) Bush RPM Line Une 00 152.8 2517 101.0 2012 2197.5 PCC 75 191.0 3020 2012 2281.1 PCC 75 191.0 3020 2012 2197.5 PCC 75 191.0 3020 2012 2281.1 PCC 75 191.0 3020 2012 2197.5 PCC 90 228-2 3020 2012 2197.5 PCC 75 191.0 3020 2012 2197.5 PCC 91.0 3020 200.0 217.3 2012 2197.5 PCC 91.0 </td <td>Drive Information Speed Ratic: 1.54 Up Input Load: 55 kW, Efficiency: 92.00 % S.F. (VB/SB): 1.30 / 1.60 Design Power (VB/SB): 95.88 kW / 118.01 kW Center Distance: 1200 mm +/-10% 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solution <u>DriveR DriveN Belt Thv Dia Tth/ Dia Grv (mm) Bush RPM Line 01 528.2 2517 401.19 2127.2 75 191.0 2012 2187.7 PCC 8MGTC-2800-36 112 285.2 2517 75 191.0 217.2 2187.7 PCC 8MGTC-2800-36 12 285.2 2517 2187.2 2197.5 PCC 8MGTC-2800-36 12 285.2 2517 2197.5 PCC 8MGTC-2803-36 12 285.2 3020 40 122.2 2012 2197.5 PCC 8MGTC-2803-36 13 </u></td> <td>Drive Information Speed Ratic: 1.54 Up Input Load: 55 kW, Efficiency: 92.00 % Maxim S.F. (VB/SB): 1.30 / 1.60 0</td> <td>Design #1 PUT Drive Information Speed Ratio: 1.54 Up Input Load: 55 kW, Efficiency: 92.00 % Maximum Rin S.F. (VB/SB): 1.30 / 1.60 Shaft Design Power (VB/SB): 9.88 kW / 118.01 kW Bushings (Design Power (VB/SB): 9.88 kW / 118.01 kW Bushings (Center Distance: 1200 mm +/-10% Belt Center C 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. Thv Dia Thv Dia Nm Pind Ideal Inst. Grv (mm) Bush RPM Picd Part Number Ideal 112 285.2 2517 410.9 2197.5 PCC 8MGTC-2800-36 1199.2 1192.2 75 191.0 3020 2197.3 PCC 8MGTC-280-36 1199.2 1192.2 75 191.0 3020 2197.3 PCC 8MGTC-280-36 1199.2 1192.2 75 191.0 3020 80 127.3 2197.5</td> <td>Application: Design #1 Drive Information Speed Ratic: 1.54 Up Input Load: 55 kW, Efficiency: 92.00 % S.F. (VB/SB): 1.30 / 1.60 RPM Maximum Rim Speed S.F. (VB/SB): 1.30 / 1.60 Design Power (VB/SB): 95.88 kW / 118.01 kW Center Distance: 1200 mm +/-10% Maximum Rim Speed S.F. (VB/SB): 1.30 / 1.60 Maximum Rim Speed Shaft Diameter Beits Checked 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. DriveR DriveN Belt Center Dist. Thv Dia Thv/ Dia RPM Line Part Number Imm, Takeup (mm) 00 152.8 2517 40 101.9 2012 2197.5 PCC BMGTC-3200-36 1199.2 1162.4 1201.0 1192.5 1199.2 1226.4 75 191.0 3020 250 127.3 2012 2187.5 PCC BMGTC-3200-36 1182.2 117.0 1135.1 1132.2 117.0 1135.0 3020 1122.4 217.5 PCC BMGTC-3200-36 1168.6 1132.2 117.0 1163.6 1163.2 117.3 1163.0 3020 1182.2 117.0 217.5 PCC BMGTC-3204.36 1168.6 1163.2 117.4 1135.0 1163.0 1163.0 1163.1 1163.2 117.0 376.0 3020 2012 2187.5 PCC BMGTC-304.36 1168.6 1132.2 117.0 376.0 3020 122.4 1197.5 122.4 7 80 228.2 3020 60 152.8 2517 2177.5 PCC BMGTC-3040-36 1163.6 1163.0 1163.0 1173.5 1132.2 117.0 376.0 3020 200.0 2517 207.4 QPH<td>Display Prode Maximum Rim Speed: S.F. (VB/SB): 1.30 / 1.60 Shaft Diameter: Design Power (VB/SB): 5.8 kW / 118.01 kW Bushings Checket: Design Power (VB/SB): 5.8 kW / 118.01 kW Bushings Checket: Design Power (VB/SB): 5.8 kW / 118.01 kW Bushings Checket: Design Power (VB/SB): 5.8 kW / 118.01 kW Bushings Checket: Of your of the stance: 1200 mm +/-10% Belt Thv Dia Thv Dia Norte Norte Desite Checket: Of 152.8 2517 401.01 2012 2197.5 PCC 8MGTC-2800-36 1199.7 1224.4 19.13 75 191.0 3020 2012 2197.5 PCC 8MGTC-2800-36 1192.2 1224.4 19.13 75 191.0 3020 2012 2197.5 PCC 8MGTC-2800-36 1132.2 117.8 18.33 75 191.0 3020 2012 2197.5 PCC 8MGTC-2800-36 1132.2 117.8 18.33 75 191.0 3020</td><td>Drive Information RPM: 14 PUT Drive Information RPM: 14 Input Load: 55 kW, Efficiency: 92.00 % Maximum Rim Speed: 33 S.F. (VB/SB): 1.30 / 1.60 Shaft Diameter: 45 Design Power (VB/SB): 95.88 kW / 118.01 kW Bushings Checked: TL Design Power (VB/SB): 95.88 kW / 118.01 kW Bushings Checked: TL Center Distance: 1200 mm +/-10% Belts Checked: Poly Chair 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. Belt Thv Dia Thv Dia RPM: Prod Inst. Takeup Belt 01 152.8 2517 40 119.2012 2197.5 PCC<8MMGTC-3200-36</td> 1199.7 1162.4 1201.0 18.74 23 112 285.2 2517 75 191.0 2517 2187.7 PCC 8MGTC-3200-36 1199.2 1182.2 117.44 13.3 18 75 191.0 3020 200.2 2197.5 PCC<!--</td--><td>Drive Information Drive Information Drive R PUT Drive Information RPM: 1465.00 Speed Ratic: 1.54 Up RPM: 1465.00 Input Load: 55 kW, Efficiency: 92.00 % Maximum Rim Speed: 33 m/s S.F. (VB/SB): 1.30 / 1.60 Maximum Rim Speed: 33 m/s Design Power (VB/SB): 55.8 kW / 118.01 kW Bushings Checked: TL Edits Checked: TL Center Distance: 1200 mm +/-10% Betts Checked: Poly Chain Carb Single I 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. Defined Thv Dia Thv Dia RPM Line Part Number Inent Takeup Defin. New Used Grv (mm) Bush RPM Line Part Number Inent Takeup Defin. New Used 112 285.2 2517 2107.5 PCC BMGTC-3200-24 1198.2 1176.4 1210.1 18.7 118.2 118.2 1170.8 118.2 1170.8</td><td>Distribution Design #1 PUT Drive Information Input Load: Drive Information DriveR Speed Ratio: 1.5 4 Up Input Load: 55 kW, Efficiency: 92.00 % RPM: 1465.0 Design Power (VB/SB): 9.30 / 1.60 Shaft Diameter: 45 mm Design Power (VB/SB): 9.88 kW / 118.01 kW Bushings Checked: TL Center Distance: 1200 mm +/-10% Belt Center Dist. Tensioning T/V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. Tensioning Belt Thv Dia Thv Dia RPM Belt Center Dist. Tensioning Thv Dia Thv Dia RPM Prod Part Number Ideal Inst. Takeup Belt Pull Grv (mm) Bush RPM Prod Part Number Ideal Inst. Takeup Belt Poid Grv (mm) Bush RPM Prod BMGTC-2800-26 1199.7 1124.4 13<18</td> 9.7 322<!--</td--><td>Design #1 Drive Information DriveR PUT Drive Information RPM: 1465.0 2 Input Load: 55 kW, Efficiency: 92.00 % Maximum Rim Speed: 33 m/s 2 S.F. (VB/SB): 1.30 / 1.60 Shaft Diameter: 45 mm 45 mm Design Power (VB/SB): 95.88 kW / 118.01 kW Bushings Checked: TU Beits Checked: Poly Chain Carbon, QuadPov Single Belts, PowerE 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. Tensioning Thv Dia Thv Dia RPM Line Part Number Ideal Inst. Takeup Defit. Belt Over Full: Belt Over Single Belts, PowerE Thv Dia Thv Dia RPM Line Part Number Imm Imm Maximum Rim Single Belt Over Full: Desiter Pull: Desiter Pull: Desiter Pull: Desiter Pull: Desiter Pull: Pull: Pull: Pull: Pull: Pull: Pull:</td><td>Application: Design #1 PUT Drive Information Input Load: Drive Status: Drive R (K) Belt Center Dist. (mm) Tension ing (mm) Belt Over (mm) Belt Over (K) Belt</td></td>	Drive Information Speed Ratic: 1.54 Up Input Load: 55 kW, Efficiency: 92.00 % S.F. (VB/SB): 1.30 / 1.60 Design Power (VB/SB): 95.88 kW / 118.01 kW Center Distance: 1200 mm +/-10% 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solution <u>DriveR DriveN Belt Thv Dia Tth/ Dia Grv (mm) Bush RPM Line 01 528.2 2517 401.19 2127.2 75 191.0 2012 2187.7 PCC 8MGTC-2800-36 112 285.2 2517 75 191.0 217.2 2187.7 PCC 8MGTC-2800-36 12 285.2 2517 2187.2 2197.5 PCC 8MGTC-2800-36 12 285.2 2517 2197.5 PCC 8MGTC-2803-36 12 285.2 3020 40 122.2 2012 2197.5 PCC 8MGTC-2803-36 13 </u>	Drive Information Speed Ratic: 1.54 Up Input Load: 55 kW, Efficiency: 92.00 % Maxim S.F. (VB/SB): 1.30 / 1.60 0	Design #1 PUT Drive Information Speed Ratio: 1.54 Up Input Load: 55 kW, Efficiency: 92.00 % Maximum Rin S.F. (VB/SB): 1.30 / 1.60 Shaft Design Power (VB/SB): 9.88 kW / 118.01 kW Bushings (Design Power (VB/SB): 9.88 kW / 118.01 kW Bushings (Center Distance: 1200 mm +/-10% Belt Center C 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. Thv Dia Thv Dia Nm Pind Ideal Inst. Grv (mm) Bush RPM Picd Part Number Ideal 112 285.2 2517 410.9 2197.5 PCC 8MGTC-2800-36 1199.2 1192.2 75 191.0 3020 2197.3 PCC 8MGTC-280-36 1199.2 1192.2 75 191.0 3020 2197.3 PCC 8MGTC-280-36 1199.2 1192.2 75 191.0 3020 80 127.3 2197.5	Application: Design #1 Drive Information Speed Ratic: 1.54 Up Input Load: 55 kW, Efficiency: 92.00 % S.F. (VB/SB): 1.30 / 1.60 RPM Maximum Rim Speed S.F. (VB/SB): 1.30 / 1.60 Design Power (VB/SB): 95.88 kW / 118.01 kW Center Distance: 1200 mm +/-10% Maximum Rim Speed S.F. (VB/SB): 1.30 / 1.60 Maximum Rim Speed Shaft Diameter Beits Checked 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. DriveR DriveN Belt Center Dist. Thv Dia Thv/ Dia RPM Line Part Number Imm, Takeup (mm) 00 152.8 2517 40 101.9 2012 2197.5 PCC BMGTC-3200-36 1199.2 1162.4 1201.0 1192.5 1199.2 1226.4 75 191.0 3020 250 127.3 2012 2187.5 PCC BMGTC-3200-36 1182.2 117.0 1135.1 1132.2 117.0 1135.0 3020 1122.4 217.5 PCC BMGTC-3200-36 1168.6 1132.2 117.0 1163.6 1163.2 117.3 1163.0 3020 1182.2 117.0 217.5 PCC BMGTC-3204.36 1168.6 1163.2 117.4 1135.0 1163.0 1163.0 1163.1 1163.2 117.0 376.0 3020 2012 2187.5 PCC BMGTC-304.36 1168.6 1132.2 117.0 376.0 3020 122.4 1197.5 122.4 7 80 228.2 3020 60 152.8 2517 2177.5 PCC BMGTC-3040-36 1163.6 1163.0 1163.0 1173.5 1132.2 117.0 376.0 3020 200.0 2517 207.4 QPH <td>Display Prode Maximum Rim Speed: S.F. (VB/SB): 1.30 / 1.60 Shaft Diameter: Design Power (VB/SB): 5.8 kW / 118.01 kW Bushings Checket: Design Power (VB/SB): 5.8 kW / 118.01 kW Bushings Checket: Design Power (VB/SB): 5.8 kW / 118.01 kW Bushings Checket: Design Power (VB/SB): 5.8 kW / 118.01 kW Bushings Checket: Of your of the stance: 1200 mm +/-10% Belt Thv Dia Thv Dia Norte Norte Desite Checket: Of 152.8 2517 401.01 2012 2197.5 PCC 8MGTC-2800-36 1199.7 1224.4 19.13 75 191.0 3020 2012 2197.5 PCC 8MGTC-2800-36 1192.2 1224.4 19.13 75 191.0 3020 2012 2197.5 PCC 8MGTC-2800-36 1132.2 117.8 18.33 75 191.0 3020 2012 2197.5 PCC 8MGTC-2800-36 1132.2 117.8 18.33 75 191.0 3020</td> <td>Drive Information RPM: 14 PUT Drive Information RPM: 14 Input Load: 55 kW, Efficiency: 92.00 % Maximum Rim Speed: 33 S.F. (VB/SB): 1.30 / 1.60 Shaft Diameter: 45 Design Power (VB/SB): 95.88 kW / 118.01 kW Bushings Checked: TL Design Power (VB/SB): 95.88 kW / 118.01 kW Bushings Checked: TL Center Distance: 1200 mm +/-10% Belts Checked: Poly Chair 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. Belt Thv Dia Thv Dia RPM: Prod Inst. Takeup Belt 01 152.8 2517 40 119.2012 2197.5 PCC<8MMGTC-3200-36</td> 1199.7 1162.4 1201.0 18.74 23 112 285.2 2517 75 191.0 2517 2187.7 PCC 8MGTC-3200-36 1199.2 1182.2 117.44 13.3 18 75 191.0 3020 200.2 2197.5 PCC </td <td>Drive Information Drive Information Drive R PUT Drive Information RPM: 1465.00 Speed Ratic: 1.54 Up RPM: 1465.00 Input Load: 55 kW, Efficiency: 92.00 % Maximum Rim Speed: 33 m/s S.F. (VB/SB): 1.30 / 1.60 Maximum Rim Speed: 33 m/s Design Power (VB/SB): 55.8 kW / 118.01 kW Bushings Checked: TL Edits Checked: TL Center Distance: 1200 mm +/-10% Betts Checked: Poly Chain Carb Single I 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. Defined Thv Dia Thv Dia RPM Line Part Number Inent Takeup Defin. New Used Grv (mm) Bush RPM Line Part Number Inent Takeup Defin. New Used 112 285.2 2517 2107.5 PCC BMGTC-3200-24 1198.2 1176.4 1210.1 18.7 118.2 118.2 1170.8 118.2 1170.8</td> <td>Distribution Design #1 PUT Drive Information Input Load: Drive Information DriveR Speed Ratio: 1.5 4 Up Input Load: 55 kW, Efficiency: 92.00 % RPM: 1465.0 Design Power (VB/SB): 9.30 / 1.60 Shaft Diameter: 45 mm Design Power (VB/SB): 9.88 kW / 118.01 kW Bushings Checked: TL Center Distance: 1200 mm +/-10% Belt Center Dist. Tensioning T/V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. Tensioning Belt Thv Dia Thv Dia RPM Belt Center Dist. Tensioning Thv Dia Thv Dia RPM Prod Part Number Ideal Inst. Takeup Belt Pull Grv (mm) Bush RPM Prod Part Number Ideal Inst. Takeup Belt Poid Grv (mm) Bush RPM Prod BMGTC-2800-26 1199.7 1124.4 13<18</td> 9.7 322 </td <td>Design #1 Drive Information DriveR PUT Drive Information RPM: 1465.0 2 Input Load: 55 kW, Efficiency: 92.00 % Maximum Rim Speed: 33 m/s 2 S.F. (VB/SB): 1.30 / 1.60 Shaft Diameter: 45 mm 45 mm Design Power (VB/SB): 95.88 kW / 118.01 kW Bushings Checked: TU Beits Checked: Poly Chain Carbon, QuadPov Single Belts, PowerE 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. Tensioning Thv Dia Thv Dia RPM Line Part Number Ideal Inst. Takeup Defit. Belt Over Full: Belt Over Single Belts, PowerE Thv Dia Thv Dia RPM Line Part Number Imm Imm Maximum Rim Single Belt Over Full: Desiter Pull: Desiter Pull: Desiter Pull: Desiter Pull: Desiter Pull: Pull: Pull: Pull: Pull: Pull: Pull:</td> <td>Application: Design #1 PUT Drive Information Input Load: Drive Status: Drive R (K) Belt Center Dist. (mm) Tension ing (mm) Belt Over (mm) Belt Over (K) Belt</td>	Display Prode Maximum Rim Speed: S.F. (VB/SB): 1.30 / 1.60 Shaft Diameter: Design Power (VB/SB): 5.8 kW / 118.01 kW Bushings Checket: Design Power (VB/SB): 5.8 kW / 118.01 kW Bushings Checket: Design Power (VB/SB): 5.8 kW / 118.01 kW Bushings Checket: Design Power (VB/SB): 5.8 kW / 118.01 kW Bushings Checket: Of your of the stance: 1200 mm +/-10% Belt Thv Dia Thv Dia Norte Norte Desite Checket: Of 152.8 2517 401.01 2012 2197.5 PCC 8MGTC-2800-36 1199.7 1224.4 19.13 75 191.0 3020 2012 2197.5 PCC 8MGTC-2800-36 1192.2 1224.4 19.13 75 191.0 3020 2012 2197.5 PCC 8MGTC-2800-36 1132.2 117.8 18.33 75 191.0 3020 2012 2197.5 PCC 8MGTC-2800-36 1132.2 117.8 18.33 75 191.0 3020	Drive Information RPM: 14 PUT Drive Information RPM: 14 Input Load: 55 kW, Efficiency: 92.00 % Maximum Rim Speed: 33 S.F. (VB/SB): 1.30 / 1.60 Shaft Diameter: 45 Design Power (VB/SB): 95.88 kW / 118.01 kW Bushings Checked: TL Design Power (VB/SB): 95.88 kW / 118.01 kW Bushings Checked: TL Center Distance: 1200 mm +/-10% Belts Checked: Poly Chair 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. Belt Thv Dia Thv Dia RPM: Prod Inst. Takeup Belt 01 152.8 2517 40 119.2012 2197.5 PCC<8MMGTC-3200-36	Drive Information Drive Information Drive R PUT Drive Information RPM: 1465.00 Speed Ratic: 1.54 Up RPM: 1465.00 Input Load: 55 kW, Efficiency: 92.00 % Maximum Rim Speed: 33 m/s S.F. (VB/SB): 1.30 / 1.60 Maximum Rim Speed: 33 m/s Design Power (VB/SB): 55.8 kW / 118.01 kW Bushings Checked: TL Edits Checked: TL Center Distance: 1200 mm +/-10% Betts Checked: Poly Chain Carb Single I 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. Defined Thv Dia Thv Dia RPM Line Part Number Inent Takeup Defin. New Used Grv (mm) Bush RPM Line Part Number Inent Takeup Defin. New Used 112 285.2 2517 2107.5 PCC BMGTC-3200-24 1198.2 1176.4 1210.1 18.7 118.2 118.2 1170.8 118.2 1170.8	Distribution Design #1 PUT Drive Information Input Load: Drive Information DriveR Speed Ratio: 1.5 4 Up Input Load: 55 kW, Efficiency: 92.00 % RPM: 1465.0 Design Power (VB/SB): 9.30 / 1.60 Shaft Diameter: 45 mm Design Power (VB/SB): 9.88 kW / 118.01 kW Bushings Checked: TL Center Distance: 1200 mm +/-10% Belt Center Dist. Tensioning T/V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. Tensioning Belt Thv Dia Thv Dia RPM Belt Center Dist. Tensioning Thv Dia Thv Dia RPM Prod Part Number Ideal Inst. Takeup Belt Pull Grv (mm) Bush RPM Prod Part Number Ideal Inst. Takeup Belt Poid Grv (mm) Bush RPM Prod BMGTC-2800-26 1199.7 1124.4 13<18	Design #1 Drive Information DriveR PUT Drive Information RPM: 1465.0 2 Input Load: 55 kW, Efficiency: 92.00 % Maximum Rim Speed: 33 m/s 2 S.F. (VB/SB): 1.30 / 1.60 Shaft Diameter: 45 mm 45 mm Design Power (VB/SB): 95.88 kW / 118.01 kW Bushings Checked: TU Beits Checked: Poly Chain Carbon, QuadPov Single Belts, PowerE 7 V and 5 Sync solutions were found. Sorted by Rel. Cost. All solutions printed. Tensioning Thv Dia Thv Dia RPM Line Part Number Ideal Inst. Takeup Defit. Belt Over Full: Belt Over Single Belts, PowerE Thv Dia Thv Dia RPM Line Part Number Imm Imm Maximum Rim Single Belt Over Full: Desiter Pull: Desiter Pull: Desiter Pull: Desiter Pull: Desiter Pull: Pull: Pull: Pull: Pull: Pull: Pull:	Application: Design #1 PUT Drive Information Input Load: Drive Status: Drive R (K) Belt Center Dist. (mm) Tension ing (mm) Belt Over (mm) Belt Over (K) Belt



DESIGN FLEX[®] PRO[™] DRIVE DETAIL REPORT EXPLANATION

Design Flex[®] Pro[™] is a free power transmission drive design program provided by Gates. Design Flex[®] Pro™ can generate Drive Detail Reports which contain a variety of information relevant to belt drive systems. The purpose of this Bulletin is to describe the engineering sections and details included in the Drive Detail Report. The figure below is an actual Drive Detail Report from the Gates Design Flex[®] Pro[™] drive design program.

Application: Design #1 INPUT Drive Information Drive R Drive N Speed Ratic: 2.00 Down Known Size: 40 Grooves 80 Grooves Speed Ratic: 2.00 Down Maximum Rim Speed: 33 m/s 33 m/s Service Factor: 1.6 Bushings Checked: TL Design Power: 17.6 kW Bushings Checked: TL Center Distance: 75.0.3 mm Bushings Checked: TL Speed Ratic: 2.00 Down Part No: BMRGTC-2000-12 8M-405-12 8M-405-12 Speed Ratic: 2.00 Down Part No: 9274-00250 7726-21040 7726-31080 GN RPM: 735.0 Top Width: 22.31 mm 22.31 mm 22.31 mm Rated Load: 18.70 kW Weight: 113 g 1.2 kg 4.4 kg Center Distance: 758.3 mm RPM: 2352 1470.0 735.0 Install/Take-Up Range: 721.7 mm to 759.3 mm Bushing Part No: 1610 2012 Bore: 12.7 mm - 42.9 mm 12.7 mm - 54.0 m 20.37 mm <th>Designed Fo</th> <th>r:</th> <th></th> <th></th> <th>Provided By</th> <th><i>י</i>:</th> <th></th> <th></th>	Designed Fo	r:			Provided By	<i>י</i> :		
INPUT Drive Information Known Belt: Poly Chain Carbon - 8MGTC-2000 - 12.00 mm Known Size: 40 Grooves Speed Ratio: 2.00 Down Input Load: 11 kW, Efficiency: 92.00 % Maximum Rim Speed: 33 m/s Service Factor: 1.6 Design Power: 17.6 kW Center Distance: 758.3 mm Bushings Checked: TL Belt Type: Poly Chain Carbon - 8M Part No: 8MGTC-2000-12 Speed Ratio: 2.00 Down Product No: 9274-00250 T726-21040 T726-2104 TTexpine 42.9 mm Lo T mm Some: - 122.7 mm 2.7 mm 2.3.7 mm Some: - 122.7 mm 2.0.3.7 mm Some: - 122.7 mm Some: - 1	Applicatio	n: Design #1						
Drive Information DriveR DriveN Known Bit: Poly Chain Carbon - 8MGTC-2000 - 12.00 mm Known Size: 40 Grooves 80 Grooves Speed Ratio: 2.00 Down RPM: 1470.0 735.0 Input Load: 11 kW, Efficiency: 92.00 % Maximum Rim Speed: 33 m/s 33 m/s Service Factor: 16 Design Power: 17.6 kW Bushings Checked: TL Center Distance: 758.3 mm Beits Checked: Poly Chain Carbon Electric SELECTED DRIVE Beit Type: Poly Chain Carbon - 8M Belt DriveR DriveN Beit Type: Poly Chain Carbon - 8M Part No: 8MGTC-2000-12 8M-40S-12 8M-60S-12 Speed Ratio: 2.00 Down Product No: 9274-00250 7726-21040 7726-31080 Mated Load: 18.70 kW Weight: 113 g 1.2 kg 4.4 kg Beit Pult: 1803 N Rim/Beit Speed: 7.8 m/s 7.7 mm's 7.8 m/s Install/Take-Up Range: 721.7 mm to 759.3 mm Bushing Part No:	NPUT							
Known betr Poly Chain Carbon - 8MC 1C-2000 - 12.00 mm Known Stel: 40 Grooves 80 Grooves Speed Ratio: 2.00 Down RPM: 1470.0 735.0 Input Load: 11 kW, Efficiency: 92.00 % Maximum Rim Speed: 33 m/s 33 m/s Service Factor: 1.6 Design Power 17.6 kW Bushings Checked: TL Design Power 17.6 kW Bushings Checked: Poly Chain Carbon Electric SELECTED DRIVE Belt Type: Poly Chain Carbon - 8M Belt DriveR DriveN Speed Ratio: 2.00 Down Product No: 9274-00250 7726-21040 7726-31080 Att Add Caci: 18.70 kW Weight: 113 g 1.2 kg 4.4 kg Beit Pull: 1803 N Rim/Belt Speed: 7.8 m/s 7.7 m/s 7.8 m/s Center Distance: 758.3 mm RPM: 235.2 1470.0 735.0 Install/Take-Up Range: 721.7 mm to 759.3 mm Bushing Part No: 1610 2012 Bore: 1610 2012 Bore: 12.7 mm - 42.9 mm 12.7 mm - 54.0 m Rib/Strand Deflection Force: 6.7 to 7.2 kg 5.0 to 5.6 kg When planning to re-install used belts, measure i recor	Keener De	Drive Informatio	n	0000 40.00	Karawa G	1	DriveR	DriveN
Speed Ratio 2.00 Down 11 KW, Efficiency: 92.00 % Maximum Rim Speed: 33 m/s 33 m/s Service Factor: 1.6 Design Powe: 17.6 kW Bushings Checked: TL Center Distance: 758.3 mm Bushings Checked: TL Electric Set Type: Poly Chain Carbon - 8M Belt DriveR DriveR Beit Type: Poly Chain Carbon - 8M Belt Maximum Rim Speed: 7726-21040 Speed Ratio: 2.00 Down Product No: 9274-00250 7726-21040 7726-31080 Maximum Rim Speed: 7.8 m/s 7.7 m/s 7.8 m/s 7.8 m/s 7.8 m/s Genter Distance: 758.3 mm Rim/Beit Speed: 7.8 m/s 7.7 m/s 7.8 m/s Genter Distance: 758.3 mm Rim/Beit Speed: 7.8 m/s 7.7 m/s 7.8 m/s Install/Take-Up Range: 721.7 mm to 759.3 mm Bushing Part No: - 1610 2012 Bore: - 101.9 mm 203.7 mm 203.7 mm 203.7 mm Pitch Diameter: - 101.9 mm 203.7 mm 203.7 mm Pitch Diameter:	Known Be Speed Pati	It: Poly Chain Carbon a: 2.00 Down	- 8MGTC	-2000 - 12.00 mm	Known Si	IZE:	40 Grooves	80 Grooves
Service Factor: 1.6 Design Power: 17.6 kW Bushings Checked: TL TL Electric Service Factor: 1.6 Design Power: 17.6 kW Bushings Checked: TL Electric Sected Distance: 758.3 mm Bushings Checked: TL Belts Checked: Part No: Bushings Checked: TL Electric Sected Ratio: 2.00 Down Product No: 9274-00250 7726-21040 7726-31080 AlM-80S-12 8M-80S-12	Speed Rail	d: 11 kW Efficiency: (2 00 %		Maximum Rim Sne	-w.	1470.0 33 m/s	735.0 33 m/s
Design Power: 17.6 kW Center Distance: Bushings Checked: TL Belts Checked: TL Poly Chain Carbon Electric SELECTED DRIVE Beit Type: Poly Chain Carbon - 8M Beit DriveR DriveR DriveN Speed Ratio: 2.00 Down Product No: 9274-00250 7726-21040 7726-31080 M RPM: 735.0 Top Width: 22.31 mm 22.31 mm 22.31 mm Rated Load: 18.70 kW Weight: 113 g 1.2 kg 4.4 kg Beit Pull: 1803 N Rim/Beit Speed: 7.8 m/s 7.7 m/s 7.8 m/s Install/Take-Up Range: 721.7 mm to 759.3 mm Bushing Part No: 1610 2012 Bore: 12.7 mm - 42.9 mm 12.7 mm - 54.0 m 203.7 mm Pitch Diameter: 101.9 mm 203.7 mm 203.7 mm Bib/Strand Deflection Distance: 11.82 mm 11.82 mm the recorded tension. Sonic Tension Meter Beit Frequency: 85 to 89 Hz 73 to 77 Hz 505C/507C Model STM Settings: Weight: 4.7g/m,Width: 12mm/#R, Span: 757mm	Service Facto	a: 11 kiv, Elliololloy. (12.00 10		Maximum rain ope		00 11/3	00 11/3
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Belt Pull: 1803 N Center Distance: Rim/Belt Speed: 7.8 m/s 7.7 m/s 7.8 m/s Center Distance: 758.3 mm RPM: 235.2 1470.0 735.0 Install/Take-Up Range: 721.7 mm to 759.3 mm Bushing Part No: 1610 2012 Bore: 12.7 mm - 42.9 mm 12.7 mm - 54.0 m Pitch Diameter: 101.9 mm 203.7 mm TENSION New Belt Used Belt Rib/Strand Deflection Distance: 11.82 mm 11.82 mm Rib/Strand Deflection Force: 6.7 to 7.2 kg 5.0 to 5.6 kg When planning to re-install used belts, measure i record the tension before removing and re-install the recorded tension. Sonic Tension Meter Belt Frequency: 85 to 89 Hz 73 to 77 Hz 505C/507C Model STM Settings: Weight: 4.7g/m,Width: 12mm/#R, Span: 757mm 757mm	Rated Loa	d: 18.70 kW		Weight:	113 g		1.2 kg	4.4 kg
Center Distance: 758.3 mm RPM: 235.2 1470.0 735.0 Install/Take-Up Range: 721.7 mm to 759.3 mm Bushing Part No: 1610 2012 Bore: 12.7 mm - 42.9 mm 12.7 mm - 54.0 m Pitch Diameter: 101.9 mm 203.7 mm TENSION New Belt Used Belt Rib/Strand Deflection Distance: 11.82 mm 11.82 mm Rib/Strand Deflection Force: 6.7 to 7.2 kg 5.0 to 5.6 kg When planning to re-install used belts, measure i record the tension before removing and re-instal the recorded tension. Sonic Tension Meter Belt Frequency: 85 to 89 Hz 73 to 77 Hz 505C/507C Model STM Settings: Weight: 4.7g/m,Width: 12mm/#R, Span: 757mm Votestinges	Belt Pu	🗄: 1803 N		Rim/Belt Speed:	7.8 m/s		7.7 m/s	7.8 m/s
Install/Take-Up Range: 721.7 mm to 759.3 mm Bushing Part No: Bore: Pitch Diameter: 12.7 mm - 42.9 mm 12.7 mm - 42.9 mm 101.9 mm 203.7 mm 2	Center Distanc	e: 758.3 mm		RPM:	235.2		1470.0	735.0
Bore: 12.7 mm - 42.9 mm 12.7 mm - 54.0 m Pitch Diameter: 101.9 mm 203.7 mm TENSION New Belt Used Belt Rib/Strand Deflection Distance: 11.82 mm 11.82 mm Rib/Strand Deflection Force: 6.7 to 7.2 kg 5.0 to 5.6 kg Sonic Tension Meter Belt Frequency: 85 to 89 Hz 73 to 77 Hz 505C/507C Model STM Settings: Weight: 4.7g/m,Width: 12mm/#R, Span: 757mm NOTES	Install/Take-Up Rang	e: 721.7 mm to 759.3	mm	Bushing Part No:			1610	2012
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	NUTES							
- The belt length was user specified.	 The belt length was 	user specified.						

Examples of the individual engineering portions of a Drive Detail Report with further explanations are shown in the figures below.

Input Section:

INPUT				
	Drive Information		DriveR	DriveN
Known Belt:	Poly Chain Carbon - 8MGTC-2000 - 12.00 mm	Known Size:	40 Grooves	80 Grooves
Speed Ratio:	2.00 Down	RPM:	1470.0	735.0
Input Load:	11 kW, Efficiency: 92.00 %	Maximum Rim Speed:	33 m/s	33 m/s
Service Factor:	1.6			
Design Power:	17.6 kW	Bushings Checked:	TL	
Center Distance:	758.3 mm	Belts Checked:	Poly Chain Carbon	
				Electric Motor

Known Belt: Belt type and size that was selected.

Speed Ratio: Desired change in speed expressed as a ratio of the larger diameter pulley to the smaller diameter pulley. The term "Up" is used if the final desired driveN speed is faster than that of the original input speed. The term "Down" is used if the final desired driven speed is slower than that of the original input speed.

Input Load: Name plate load rating or load capacity of the prime mover or power source.

Service Factor: Multiplier used to account for drive design characteristics such as daily run time, shock or impulse loading, and motor starting characteristics.

Design Power: Input load multiplied by the Service Factor. Design Flex[®] Pro[™] uses Design Power to size belt drive systems.

Centre Distance: Minimum and maximum distance from the centre of the driveR to the centre of the driveN shaft.

RPM: Rotational speed of the driveR shaft, and the desired rotational speed of the driveN shaft.

Maximum Rim Speed: Maximum allowable linear speed at the outer rim of the pulleys. The default maximum for Gates stock components is 40 meters per second (m/s). The default is 33m/s.

Bushings Checked: Indicates specific user selected bushing family types. The default is "Any".

Belts Checked: Indicates specific user selected belt types for Design Flex[®] Pro[™] to use in the drive design process.

Selected Drive Section:

INPUT				
	Drive Information		DriveR	DriveN
Known Belt:	Poly Chain Carbon - 8MGTC-2000 - 12.00 mm	Known Size:	40 Grooves	80 Grooves
Speed Ratio:	2.00 Down	RPM:	1470.0	735.0
Input Load:	11 kW, Efficiency: 92.00 %	Maximum Rim Speed:	33 m/s	33 m/s
Service Factor:	1.6			
Design Power:	17.6 kW	Bushings Checked:	TL	
Center Distance:	758.3 mm	Belts Checked:	Poly Chain Carbon	
				Electric Motor

Belt Type: Specifies the belt type used in the selected drive.

Speed Ratio: Calculated speed change expressed as a ratio of the selected larger diameter pulley to the selected smaller diameter pulley.

dN RPM: Calculated rotational speed of the selected driveN shaft, based on the calculated speed ratio and input rotational speed.

Rated Load: Calculated load capacity of the selected drive based on the smaller diameter pulley. Rated Load will be highlighted in Red if it is less than the Design Power.

Belt Pull: The vectoral addition of tight and slack side belt span tensions based on input load (not design load). It represents the magnitude of pull that belt drives are expected to exert on shafts while transmitting input loads. The Belt Pull calculation assumes belts are pretensioned to the ideal level, which assumes a dynamic tension ratio of 5:1 for V-belt drives and 8:1 for synchronous belt drives. Belt pull is not equivalent to shaft load, as shaft load includes the added contribution of pulley weight.

Center Distance: Calculated distance between shaft centers of the selected drive, using nominal pulley and belt dimensions.

Install/Take-up Range: Calculated distance between shaft centers of the selected drive including recommended maximum and minimum allowances for belt installation and tensioning.

Tension Section:

TENSION			
Rib/Strand Deflection Distance: Rib/Strand Deflection Force:	New Belt 11.82 mm 6.7 to 7.2 kg	Used Belt 11.82 mm 5.0 to 5.6 kg	When planning to re-install used belts, measure and record the tension before removing and re-install at
Sonic Tension Meter			the recorded tension.
Belt Frequency:	85 to 89 Hz	73 to 77 Hz	
505C/507C Model STM Settings:	Weight: 4.7g/m,Width:	12mm/#R, Span: 757mm	

Rib/Strand Deflection Distance: Calculated value based on a deflection distance of 1mm per 100mm of belt span length.

Rib/Strand Deflection Force: Force required to deflect the belt span (at mid-point) the calculated deflection distance based on the recommended Static Tension (per rib/strand).

User Tips:

• Divide a Deflection Force in Newtons (N) by 9.81 to convert it to kilograms (kg). Another option is to have the Design Report display the Deflection Force in kilograms. To achieve this select 'Tools' and then 'Units of Measure...' from the top menu on the front screen. You can then select 'New' from the 'Name' box at the top and type a new name. Change the Deflection Force listed under Force Units from N to kg.

Belt Frequency: Static Tension (per rib/strand) expressed in frequency units (Hz).

505C/507C Model Settings: Values required to use the Gates Sonic Tension Meter (either model 505C or 507C) to measure Static Tension.

Notes Section:

TENSION	New Polt	Used Belt	
Rib/Strand Deflection Distance: Rib/Strand Deflection Force:	11.82 mm 6.7 to 7.2 kg	11.82 mm 5.0 to 5.6 kg	When planning to re-install used belts, measure and record the tension before removing and re-install at
Sonic Tension Meter	05 to 00 Uz	72 4- 77 4-	the recorded tension.
505C/507C Model STM Settings:	Weight: 4.7g/m,Width:	12mm/#R, Span: 757mm	

This section will advise of any issues in meeting the input data. E.g. The DriveR pulley maximum bore is less than the shaft diameter specified. Please consider these notes before finalising your design.

The bottom of the report states the date and version of the program at the time of producing this report. Check the version of customer drive reports to make sure that they are using the latest version.

11/09/2012 12:34 PM

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2.06/2.00/2.03/ Dyn Europe

Design $\operatorname{Flex}^{\mathbb{B}}$ Pro^{\mathbb{M}} is a simple yet powerful drive design tool. With a greater understanding of the output content, users are able to make better drive selections. In addition, an improved understanding of the engineering calculations will enable a deeper understanding of the influence on other drive system components.

Design Flex[®] Pro[™] is available to download for free from <u>www.gates.com/designflex</u>.

DESIGN FLEX[®] PRO[™] – TROUBLE SHOOTING

Type Initializer and Error 1303 message explanations. Both are rights issues. Error 1303 is caused by a more "locked down" system than the Type Initializer error.

However the fix is usually the same for both. So make sure you download the software from the links below.

This is an issue with the Windows security center and installing required Microsoft files which should be there – but aren't. Here's our standard response on this: Design Flex[®] Pro[™] runs on the following versions of Windows - XP, Vista, Windows 7,

Design Flex[®] Pro[™] runs on the following versions of Windows - XP, Vista, Windows 7, Windows 8 – in both 32 and 64 bit modes. However, the Windows Security Center and/or Corporate IT/IS departments often prevent successful installation because Design Flex[®] Pro[™] relies on required Microsoft System files which Microsoft states are part of all standard installs, but do not seem to make it into many actual installations. The Security Center or Security Policies prevents our installer from installing these necessary system files.

Type Initiator error:

Design Flex[®] Pro[™] is tested and operates on:

- > Windows 8
- > Windows 7 32 and 64– all service packs
- > Vista 32 and 64 all service packs
- > XP 32 and 64 all service packs

We see the type initiator error in two cases:

> A prior version was installed on a computer by a different person or the person performing the install's rights have changed. The person running the install then does not have permission to over-write all the files – we haven't figured out yet why they can over-write some files and not others. This results in a partial install.

> The person performing the install has restricted rights not allowing them to run an install which then runs a system-level install. When the Gates program detects that there are missing Microsoft support files, it calls a web-based Microsoft installer to install them. Some security center rights prevent this from working.

The easiest way – but doesn't always solve issues related to the first case - to get past this error is to verify that the installers for the Microsoft Dot Net Framework and the Microsoft Runtime Support files ran. To do this:

> Install the Dot Net Framework 4.0 from:

http://www.microsoft.com/downloads/en/details.aspx?FamilyID=9CFB2D51-5FF4-4491-B0E5-B386F32C0992

> Install the version 10 Runtimes from:

http://www.microsoft.com/downloads/en/details.aspx?FamilyID=A7B7A05E-6DE6-4D3A-A423-37BF0912DB84

Test the Design program – if it works, everything is good and you are done. Otherwise, we have to remove the traces of an older install so that we can fully install the new program. To do that:

- > Go to Start-Control Panel-Add/Remove programs and un-install DFPro Std
- > Go to C:\Program Files\Gates Corporation and delete the entire Design Flex Pro folder
 - > This would be C:\Program Files (x86)\Gates Corporation on Windows 7-64.
 - > This does not remove any user information or files
- > Re-install the Design Flex[®] Pro[™] software

As mentioned there are no compatibility issues with running Design Flex[®] Pro[™] on Windows 7. You can run into issues if you go to www.gates.com/designflex and select Run. You are best to Save the file to your computer in a location you can easily find it, eg the Desktop.

Once it has finished downloading, right click on the install file and then click on Run as administrator.

