

This document and the design features or construction disclosed are property of Wenger Mfg., Inc. and shall not be reproduced without written permission. They shall not be used in any manner detrimental to Wenger's interest and shall be returned upon request. Wenger Mfg., Inc., P.O. Box 130, Sabetha, KS 66534, USA.

**Revisions:**

Product Description	Final Size	Protein	Internal Fat	Bulk Density	Moisture Content Wet Basis		Notes	Maximum Capacity
					Into Dryer	Out Of Dryer		
	mm	%	%	lb/ft <sup>3</sup>	%	%		lb/hr
Textured Meat Protein (TMP)	5-15	< 26	< 1	24	<50	>20	29	880-1200

**Equipment will be designed for following utility specifications:**

Water: 4 bar (400 kPa) (60 psig) minimum  
 Compressed Air: 7 bar (700 kPa) (100 psig) minimum  
 Steam: 8.5-10 bar (850-1000 kPa) (125-150 psig) minimum  
 Natural Gas:  
 8900 kcal/m<sup>3</sup> (1000 Btu/ft<sup>3</sup>)  
 0.25-0.35 bar (25-35 kPa) (3.5-5.0 psig)  
 0.6 specific gravity  
 Chemical composition similar to 90% CH<sub>4</sub>, 5% C<sub>2</sub>H<sub>6</sub>, 5% N<sub>2</sub>  
 100% propane, 100% butane, or a mixture of both is acceptable. However, unless otherwise specified, equipment will be designed and built for natural gas.

**Equipment will be designed for following electrical specifications:**

Motors:  
 440-480 Volts  
 60 Hertz  
 3-Phase  
 Starter Signal/Control Voltage used to energize coils on motor starters: 110-120 Vac  
 Brand: Wenger to specify  
 Motors under 11 kW (15 hp) will be direct start  
 Motors 11 kW (15 hp) and larger will be wye start / delta run  
 Motor enclosures: TEFC  
 Control Panel: IP52 (NEMA 12) unless specified otherwise  
 1-Phase Voltage: 110-120 Volt  
 Flame Safety and Gas Train Voltage: 110-120 Volt  
 Field Device Voltage: 110-120 Volts

Item	Wenger Shop Order Number	Equipment Description	Equipment Code
01.	12845-1	Used TC Dryer	DO/VII/2400/3Z//A/3-Six//TJ/SM/FA/F/NNY/
02.	12845-2	APM Basic for Dryer	
03.		TX85 MAG ST Extruder	TX85/SS4HC/MNA///

<b>Saturated Steam Requirements for Sizing Lines (Connected) (see notes 4 and 19)</b>							
Item	Equipment Description	Item Description	Type	Pressure	Duty		Notes
				psig		lb/hr	
03.	TX85 MAG ST Extruder	Extruder Barrel Heating	3	80	100%	100	Estimated requirement for future HIP
		Extruder Barrel Injection	1	100	100%	210	
		Future HIP	1	30	100%	750	
		Total for Item 03				1060	
		Total For Everything				1060	

Type: 1=process (into product), 2=heating (returnable to boiler), 3=heating (not returnable to boiler), 4=humidity control (into air)

<b>Saturated Steam Requirements for Estimated Used (Consumed) (see notes 5 and 19)</b>			
Item	Product Description		Notes
		lb/hr	
	Textured Meat Protein (TMP) @ 5-15	125	
	Average for All Products	125	

<b>Water Requirements for Sizing Lines (Connected) (see notes 4, 8 and 20)</b>							
Item	Equipment Description	Item Description	Type	Pressure	Duty		Notes
				psig		lb/hr	
03.	TX85 MAG ST Extruder	Extruder Barrel Cooling	3	60	100%	1100	
		Extruder Barrel Injection	1	60	100%	300	
		Future HIP	1	60	100%	1100	
		Gearbox Cooling	2	60	100%	1100	
		Total for Item 03				3600	
		Total For Everything				3600	

Type: 1=process (into product), 2=cooling (reuseable), 3=heating (not reuseable), 4=closed loop heating and/or cooling

<b>Water Requirements for Estimated Used (Consumed) (see notes 5, 8 and 20)</b>			
Item	Product Description		Notes
		lb/hr	
	Textured Meat Protein (TMP) @ 5-15	920	
	Average for All Products	920	

<b>Compressed Air Requirements for Sizing Lines (Connected) (see notes 4, 6, 9 and 21)</b>							
--	--	--	--	--	--	--	--

Item	Equipment Description	Item Description	Type	Pressure	Duty		Notes
				psig		cfm	
03.	TX85 MAG ST Extruder	Downspout Bypass	2	80	1%	4.0	
		Head Jacket Plumbing	1	80	100%	0.29	
		Total for Item 03					4.3
		Total For Everything					4.3

Type: 1=dry instrument air, 2=lubricated for cylinders, etc.

<b>Compressed Air Requirements for Estimated Used (Consumed) (see notes 5, 6, 9 and 21)</b>			
Item	Product Description		Notes
			cfm
	Textured Meat Protein (TMP) @ 5-15		0.20
	Average for All Products		0.20

<b>Gas Requirements for Sizing Lines (Connected) (see notes 4)</b>							
Item	Equipment Description	Item Description	Type	Pressure	Duty		Notes
				psig		cfh	
02.	Used TC Dryer (3 pass DO)	Heating Gas	1	4	100%	2462	
		Total For Everything					2462

Type: 1=natural, 2=propane, 3=butane, 4=fuel oil, 5=other

<b>Gas Requirements for Estimated Used (Consumed) (see notes 5)</b>			
Item	Product Description		Notes
			cfh
	Textured Meat Protein (TMP) @ 5-15		1894
	Average for All Products		

<b>Exhaust Air Requirements for Sizing Lines (Connected) (see notes 25)</b>							
Item	Equipment Description	Item Description	Type	Pressure	Duty		Notes
				in wc		cfm	
01.	Used TC Dryer (3 pass DO)	Dryer Exhaust		10	100%	4500	
		Total for Item 01					4500
		Total For Everything					4500

Exhaust Air Requirements for Estimated Used (Consumed) (see notes 25)			
Item	Product Description		Notes
		cfm	
	Textured Meat Protein (TMP) @ 5-15	4500	
	Average for All Products	4500	

Electrical Requirements for Sizing (Connected) (see notes 4, 5, 6, 7, 10, 11 and 23)												
Item	Equipment Description	Item Description	Type	Qty	Hp	kW	V	Ø	Hz	Amps	kVA	Notes
01.	Used TC Dryer	Oscillating Spout Sprdr	011	1	0.75	0.56	460	3	60	1	0	
		Conveyor Drive 1	011	1	1.0	0.75	460	3	60	2	0	
		Conveyor Drive 2	011	1	1.0	0.75	460	3	60	2	0	
		Conveyor Drive 3	011	1	1.0	0.75	460	3	60	2	0	
		Recirculation Fans	011	6	7.5	5.6	460	3	60	11	2	
		Dryer Exhaust Fan	011	1	25	19	460	3	60	40	8	14
		Combustion Blower	001	6	1	.75	460	3	60	1.8	1.4	
		Fines Augers	001	3	0.33	0.25	460	3	60	1	0	
		Side Plenum Augers	001	2	0.33	0.25	460	3	60	1	0	
			Total for Item 01			22	81	57				116
02.	APM Basic for Dryer	APM Basic Control Panel	3	1			115	1	60	10	5	
		Total for Item 02		0						10	5	
03.	TX85 MAG ST Extruder	Lube Pump	001	1	1.3	0.98	460	3	60	3	1	
		Main Drive	011	1	250	188	460	3	60	200	40	14
		Knife Drive	011	1	5.0	3.8	460	3	60	8	2	
		Total for Item 03		3	242	182				211	43	
Total For Everything				25	322	240				337	147	

panel type: 1=other, 2=graphical manual control panel, 3=computer control panel, 4=motor control center  
motor type: 000=no motor, 001=AC constant speed motor, 011=AC motor with VFD  
101=reversing AC constant speed motor, 111=reversing AC motor with VFD  
002=DC drive, 022=SCR type DC drive, 003=Electro-mechanical drive, 990=Resistance heating

Electrical Requirements for Estimated Used (Consumed) (see notes 5, 6, 7, 10, 11 and 23)			
Item	Product Description		Notes
		kW	
	Textured Meat Protein (TMP) @ 5-15	192	
	Average for All Products	192	

**Notes:**

3/29/2011

page 4 of 5

01. This information is provided to assist a client in the design of his plant. Since most processes are proprietary and Wenger does not have all the information necessary, Wenger assumes no responsibility for its accuracy or completeness.
02. Product capacities listed are measured after drying and cooling and before application of external coatings, unless noted otherwise.
03. Products listed are generic, and actual capacities may vary, depending on the specific products to be produced. Utilities for sizing (connected) are based on the product with the highest capacity.
04. Sizing (connected) values always include a margin to meet cold startup requirements and generally include excess capacity to meet unforeseen requirements. Values shown should be used for sizing such things as boilers, pipes, wires, etc.
05. Used (consumed) values are what should be required to operate the equipment after running conditions are reached, if the equipment is operated as expected. These are product specific. Values shown may be used for estimating utility costs.
06. Duty cycle is defined as the percentage time of operation during a normal production run.
07. Factor is the ratio of consumed to connected.
08. Water requirements shown do not include that required for cleaning or charging closed loop heating and/or cooling systems.
09. Compressed air requirements shown do not include that required for cleaning.
10. Power factor of all motors is assumed to be 85%.
11. Motor control center (MCC) with starters furnished by client.
13. See proposal for detailed descriptions of equipment.
14. This item is suitable for a wye start, delta run, type starter.
15. Capacity listed does not include coatings.
19. Client to furnish saturated steam at a minimum pressure of 8.7 bar (125 psig). The pressure will be reduced to the value shown.
20. Client to furnish water at a minimum pressure of 4.2 bar (60 psig). The pressure will be reduced to the value shown.
21. Client to furnish compressed air at a minimum pressure of 7.0 bar (100 psig). The pressure will be reduced to the value shown.
23. Amps shown are normal NEMA full load amps at voltage shown. See Parts Manual and vendor instructions for actual full load amps. See appropriate codes for wire and fuse sizing.
25. Exhaust air volumes shown are at actual conditions: adjusted for temperature and elevation.