REQUEST FOR PROPOSAL
FORACE
SA09_ MEMBRANE SURFACE INSPECTION MACHINE REV 1.0
(09/10/2024)

Attachment: 1
Functional & Technical Specifications

W.L. Gore & Associates (Shenzhen) Co., Ltd.

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All questions regarding this RFP should be directed to the appropriate contact listed below:

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Document Revision History			
Revision	Issue Date (mm/dd/yyyy)	Author(s)	Change Description
1.0	9/10/2024	Roy Zheng	Initial issue of document.

Contents

1. Compliance 合规性

1.1. Instructions for Completing the Compliance Agreement 完成合规协议的说明

1.1.1. Responses of "To be negotiated" are not acceptable and will be treated as if the Supplier Does not comply. Referencing an existing agreement between Supplier and W.L. Gore (or a W.L. Gore affiliate) is not acceptable and will be treated as if the Supplier Does not comply. "有待协商"的回答是不可接受的，将被视为供应商不遵守。引用供应商和 W.L. Gore（或 W.L. Gore 附属公司）之间的现有协议是不可接受的，并且将被视为供应商不遵守。

1.1.2. If any RFP section requests an explanation or a description, then the Supplier should state "Yes" and provide the requested information. 如果征求方案书的任何章节要求解释或说明，则供应商应声明"是"，并提出所要求的信息。

1.1.3. If an RFP section specifies one or more requirements (e.g. The Supplier shall provide… etc.), then the Supplier should only state "Yes" if the Supplier fully complies without exception to all the requirements in the section. 假如征求方案书的某一章节规定了一个或多个要求（如供货商应提供……等），如果供应商完全遵守本节的所有要求，则供应商只应声明"是"。

1.1.4. If the Supplier takes exception to one or more requirements in any section of the RFP, then the Supplier should state "No" in the box and delineate which specific requirements it takes exception to and also state that it is compliant to all other requirements as applicable. For example: 如果供应商反对征求方案书的任何章节中的一个或多个要求，则供应商应在格子中声明"否"，并描述其例外的具体要求，并说明其遵守所有其他要求。例如：
"No – Supplier is compliant to all the above requirements with exception to the following two items: (a) and (b)" "不，供应商符合上述所有要求，但以下两项除外：（a）和（b）

1.1.5. Each compliance section should be signed and dated. The absence of signature or date in any compliance box will be treated as "Does not comply" 每个合规章节均应签署并注明日期。在任何格子中没有签名或日期，将被视为"不遵守"。

2. Project Outline 项目大纲

2.1. Project Management Requirements 项目管理要求

2.1.1. The Equipment Supplier shall identify one person to act as Project Manager. This person must have technical skills and will be the principal engineering interface between the membrane Inspection Machine Project Engineer and the Equipment Supplier.- 设备供应商应指定一个人担任项目经理。这个人必须

有技术能力，并将是透气膜检验机项目工程师和设备供应商之间的主要工程接口。

2.1.2. Bi-weekly update (communication) will be scheduled to review project status and discuss issues. The supplier will maintain an "Open Issues" log, which will be used as the agenda for the meeting. 每两周一次的更新（沟通）将被安排为审查项目状态和讨论问题。供应商将保持一个“未决问题”日志，并作为会议议程。

2.1.3. The Equipment Supplier shall provide and maintain a project work plan (Microsoft Project preferred). The work plan should be in sufficient detail and identify key milestones so the project can be tracked. 设备供应商应提供和维护项目工作计划（微软项目软件优先）。该工作计划应足够详细，并确定关键里程碑，以便跟踪项目。

2.1.4. Three Formal Design Reviews shall be conducted along the project execution. 三项正式设计评审应在项目执行阶段进行。

2.1.5. Design Review I - DRI will be the start of the detailed design effort. It will be a Gore internal decision-making meeting intended to give firm direction to the Equipment Supplier so that a "go-for-one" proposal can be developed. 设计评审 I -DRI 将是详细设计工作的开始。这将是一个 Gore 内部决策会议，旨在给设备供应商提供坚定的指导，以便“选择一个方案”得以开展。

2.1.6. Design Review II - DRII will be at the conclusion of the detailed design effort and before the Equipment Supplier begins fabrication of the system. The intention of this meeting is to give the Equipment Supplier approval to move into the Fabrication phase of the project. Approval by Gore Project Engineer and Safety Engineer is required before the Equipment Supplier is authorized to move into the Fabrication phase of the project. 设计审查 II - DRII 将在详细设计的结论，并在设备供应商开始制造系统前进行。本次会议的目的是给设备供应商批准进入项目的制造阶段。在设备供应商被授权进入项目的制造阶段之前，需要由戈尔项目工程师和安全工程师批准。

2.1.7. Design Review III - DRIII will be after completion of FAT. The intention of DRIII will be a working meeting to initiate plans to resolve issues identified during FAT. 设计审查 III - DRIII 将在工厂验收测试后进行。DRIII 的意图将是一个工作会议，以启动解决工厂验收测试中所发现问题的计划。

2.2. Project Scope 项目范围

2.2.1. The equipment supplier will deliver a vent membrane roll inspection machine, which will fulfill the functional requirements in section 3. 设备供应商将交付防水透气膜卷材检验机，该机器满足第 3 节所述的功能要求。

2.2.2. The equipment supplier will deliver machine documentation, which is described in the documentation requirements in section 4. 设备供应商将提供机器文件，该文件在第 4 节的文件要求中描述。

2.2.3. The equipment supplier will deliver a set of machine spare parts and accessories, which are described in the other requirements in section 5. 设备供应商将提供一套机器备件和附件，该备件及附件在第 5 节的其他要求中描述。

2.2.4. The equipment supplier will provide service described in the other requirements in section 5. 设备供应商将提供相关服务，该服务在第 5 节中的其他要求中描述。

2.2.5. The equipment supplier will provide training, which is described in the other requirements in section 5. 设备供应商将提供培训，该培训在第 5 节中的其他要求中进行了描述。

2.3. Gore Deliverables 戈尔提供项

2.3.1. Gore will supply all materials required to run FAT a minimum of one week prior to scheduled FAT. 戈尔将在至少一周前提供 FAT 所需的所有材料。

2.3.2. Gore will supply the FAT&SAT report templates two weeks prior to the scheduled FAT&SAT. 戈尔将在 FAT 和 SAT 之前两周提供 FAT 和 SAT 报告模板。

2.4. Project Timeline 项目时间

2.4.1. Provide information around critical time lines, stages, milestones etc. 提供关键时间线、阶段、里程碑等信息。

2.4.2. See Table 2-1: Project Outline 见表 2-1：项目大纲

Table 2-1: Project Outline

Item	Deliverable 应交付的	Owner 负责人	Timing 时间	Description 描述
A	Proposal 方案	☐ Gore ☒ Supplier	As specified on the Cover page 如封面所述	As defined by this document 如本文件所定义。
B	Design Review I - Proposal Review 设计审查 I – 方案评审	☒ Gore ☐ Supplier		Gore internal review meeting 戈尔内部评审会议。
C	Place Purchase Order 下采购订单	☒ Gore ☐ Supplier		

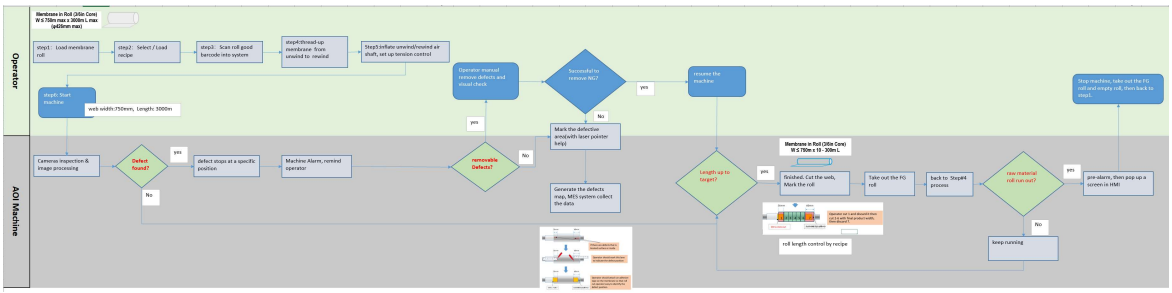
Item	Deliverable 应交付的	Owner 负责人	Timing 时间	Description 描述
D	Project Timeline Submittal 提交项目时间表	☐ Gore ☒ Supplier	7 days after Item C C 事项后 7 天内	Detailed schedule with significant milestones and completion dates
E	Risk assessment 风险评估	☒ Gore ☒ Supplier	Before MFMEA 在 MFMEA 前	
F	MFMEA 机器失效模式分析	☒ Gore ☒ Supplier	Before creation of Detailed Design Proposal 在详细设计之前	
G	Design 设计	☐ Gore ☒ Supplier		
H	Equipment Design Project Updates 设备设计项目更新	☐ Gore ☒ Supplier	Weekly 每周	
I	Design Review II (DQ) Mechanical & Electrical 设计审查 II – 机械&电气评审	☒ Gore ☒ Supplier		Verify that the detailed design meets Gore's specifications and reflects proper execution of the quoted operation 验证详细设计符合戈尔规范并反映报价操作的正确执行
J	OK to Tool Approval 加工批准	☒ Gore ☐ Supplier		
K	Equipment Fabrication Project Updates	☐ Gore ☒ Supplier	*Bi weekly* 每两周	Project updates to be communicated at specified intervals throughout project by documented evidence of project progress (pictures, videos etc.)
L	Build Progress Review 制造进展评审	☒ Gore ☒ Supplier	Monthly 月度	Supplier's project lead and engineering support will be available for at minimum a 1 day progress review at the Supplier's site 供应商的项目领导和工程支持将至少在供应商现场进行 1 天的进度审查。

Item	Deliverable 应交付的	Owner 负责人	Timing 时间	Description 描述
M	HMI Screen review HMI 界面评审	☒ Gore ☒ Supplier		
N	Electrical measurement/assembly test 电气/装配测试	☐ Gore ☒ Supplier	2 week prior to Item O O 事项前两周完成	
O	Pre-FAT check 预先 FAT 检查	☒ Gore ☒ Supplier	1 week prior to Item P P 事项前 1 周完成	
P	Factory Acceptance Test 工厂验收测试	☒ Gore ☒ Supplier		FAT outlined below in §6.2 Factory acceptance test FAT 大纲在 6.2 中描述
Q	Shipment 运输	☐ Gore ☒ Supplier		Contingent upon successful completion of FAT 视 FAT 的成功完成而定
R	Installation 安装	☐ Gore ☒ Supplier		If Supplier, describe installation requirements 如果是供应商实施，请描述安装要求
S	Site Acceptance Test 现场验收测试	☒ Gore ☐ Supplier		SAT outlined below in §6.3 Customer acceptance test SAT 大纲在 6.3 中描述
T	Final Documentation 最终文件	☐ Gore ☒ Supplier	2 weeks after Item S S 事项后两周	See Table 4-1:Documentation timing for final documentation list 见表 4-1.

Section 2 Compliance		**Project Outline**	**Signature & Date**
		If “No”, list exceptions by paragraph number stating reason for exception(s), and if applicable, alternatives. 如果“否”，则用段落号码列出例外并说明理由，如果适用的话，列出备选方案。	
Yes ☐	No ☐		

3. Functional Requirements 功能要求

3.1. Process Flow Chart & Operation Sequence



Full details are given in Appendix 1, document name is “Process Map-SA09 Membrane Insp MC”.

Process Map-SA09
Membrane Insp M/C

3.2. Equipment Specification 设备技术规格

3.2.1. The machine must have functional units as listed: unwinding unit, Camera inspection unit for both sides, visual inspection, rewinding unit, HMI etc. 机器必须有如下所列的功能单元:放卷单元，两边的摄像头检查单元，目视检查，放卷单元，人机界面等。

3.2.2. During the operation of the equipment, no fluorine pollution is allowed to the material, and all hardware materials in contact with the film materials should not contain fluorine 整个设备的运行过程中不允许给材料带来任何的氟污染，要求所有和薄膜材料接触的硬件材料都不能含有氟。

3.2.3. For hardware components requirements, please pefer to “04_Gore Preferred Component Brand List” 关于零部件的要求，请参考“03_Gore Preferred Component Brand List”。

3.2.4. Recipe Driven or Job Control.

3.2.4.1. The camera inspection system accommodates different products offering sophisticated recipe controls (so far 3 Part Numbers available). On the engineering level recipe adjustments can be made for defect classifiers by product name. Operators are allowed to select predefined recipes via the "next roll" function prior to a new product run. The recipe change can be performed manually via a simplified job change dialog or by an automated line interface. 摄像头检查系统容纳不同的产品提供复杂的配方控制(到目前为止 3 部分号码可用)。在工程层面上，可以通过产品名称对缺陷分类器进行配方调整。在运行新产品之前，允许操作人员通过"下一卷"函数选择预定义的配方。配方更改可以通过简化的作业更改对话框或自动化的行接口手动执行。

3.2.5. Membrane roll inspection reports can be created after a roll change The Roll Reports can be generated automatically, stored on a network drive or local drive. In case of further processing (roll cut, slitting) new reports can be generated as sub rolls, these reports can as well be printed out or stored on a network drive. 可以在后创建膜材的检测报告。roll report 可以自动生成，存储在网络驱动器或本地驱动器。在进一步处理(卷切，分切)的情况下，可以生成新的报告作为子卷，这些报告也可以打印出来或存储在网络驱动器上。

3.2.6. **Unwind unit 放卷单元**

3.2.6.1. The unwind shaft shall be 放卷轴需具备

3.2.6.1.1. An air inflated shaft with a local switch to inflate/deflate with indicator (Maximum inflation pressure 100psi) 一个气胀轴可以被按钮就近控制充气和放气，气压值带有指示。最大充气压力 100psi.

3.2.6.1.2. Capable of handling material with a maximum width of 800 mm. 需能够支持最大芯轴宽度为 800mm

3.2.6.1.3. The blade length of the air inflated shaft is not less than 800mm, and there is a scale mark on the shaft. 气胀轴的叶片长度为不小于 800mm， 轴上有刻度标识。

3.2.6.1.4. Capable of handling a core with a 3 inch inside diameter (With capability to switch out to 6 inch core shaft) 能够套上内径为 3 英寸（76.2mm）的芯轴。并具备套上内径为 6 英寸（152.4mm）芯轴的能力。

3.2.6.1.5. The leaf airshaft shall be equipped with a local switch or button for inflation/deflation. Typical inflation pressure is 60psi (0.4MPa). Pressure set point should be adjustable by regulator and visible on supplied gage. 叶片式气胀轴应装有充气/放气的本地开关或按钮。通常的充气压力为 60psi（0.4MPa）。压力设定点应通过调节阀调节，并在压力表上显示。

3.2.6.1.6. Capable of handling material with a maximum width of 800 mm. 需能够支持最大芯轴宽度为 800mm.

3.2.6.2. Have the ability to tension between 3N to 30N (total) with a +/- 15% variation maximum (during starting, running and stopping of the machine) 需具备控制 3N 到 30N（总的）张力，最大误差范围不超过+/- 15%。（在设备开始，运行及暂停中）

3.2.6.2.1. Controller adjusts output to clutch via PID loop to match the tension set point. 控制器通过 PID 回路调整输出离合器，以匹配张力设定点

3.2.6.2.2. The PC control system can adjust the torque according to the tension deviation from set point automatically. 控制系统能根据实际张力与设定张力差自动调整张力

3.2.6.2.3. 戈尔建议选用 Merobel 品牌的闭环张力控制系统。

3.2.6.2.4. 保证 web handling 系统不会造成 Film 无打滑(no slippage)

3.2.6.3. Raw material roll can be adjusted and fixed in any position of the unwinding shaft. Machine side (rear) roll edge to be fixed for all roll widths. 来料卷能被调整并固定在放卷轴的任一位置。所有不同来料宽度的料靠近机器侧的都能被固定。

3.2.6.4. The unwinding shaft must be able to run forward or reverse unwinding. There is an automatic target stop control to allow defect remove and marking by operator. 放卷轴必须能正转和反转，有一个自动目标停止控制，允许操作员去除缺陷和标记。

3.2.6.5. The Drum roller shall be made of transparent material (Acrylic is preferred) with a sufficiently smooth and wear-resistant surface. 滚筒应采用透明材料制成（首选 Acrylic），表面足够光滑、耐磨。

3.2.6.6. Enough static eliminators should be in place 需要有足够的除静电器. 除静电器的位置尽可能靠近工件，互不干扰(位置调整)。

3.2.7. Camera inspection station 相机检验工站

3.2.7.1. Camera resolution: GORE recommend camera resolution is 20um x 20um = 0.0004 mm^2 /pix. minimum detection limit is 0.0004 x 2 = 0.0008 mm^2 。 相机分辨率:GORE 推荐相机分辨率为 20um x 20um = 0.0004 mm2 /pix。最低检测限为 0.0004 x 2 = 0.0008 mm2

3.2.7.2. Should be high resolution & high-speed line scan camera and advanced illumination technology for highest contrast, sensitivity. Should detect low-contrast defects like wrinkles, small particles… 应该是高分辨率和高速线扫描相机和先进的照明技术，以达到最高的对比度和灵敏度。应该检测低对比度的缺陷，如皱纹、小颗粒……

3.2.7.3. Different defects need different views to be detected, therefore, Gore request supplier to evaluate if it is possible to use 3 different LED lights with different angle for gaining better inspection capabilities, then combining different image defects in a single camera row. Gore preferred to select high uniformity LED line lights (分时频闪 stroboscopic technique). 不同的缺陷需要不同的视角来检测，因此，Gore 要求供应商评估是否可以使用 3 个不同角度的 LED 灯来获得更好的检测能力，然后将不同的图像缺陷组合在一个相机排中。Gore 更倾向于选择高均匀性的 LED 线灯(分时频闪技术)。

3.2.7.4. 100% film web surface in-line inspection, web vibration/waviness should be controlled in appropriate range, it should not impact on inspection capabilities. 100% 薄膜卷筒表面在线检测，卷筒振动/波纹度应控制在适当范围内，不应影响检测能力。

3.2.7.5. Detects and classifies defects and marks their type and location on reel defect map, so that operator can use the reel defect map to make smart cuts in manual inspection station and save the material. 对缺陷进行检测和分类，并将缺陷的类型和位置标记在卷取机缺陷图上，便于操作员在人工检测站利用卷取机缺陷图进行智能切割，节省材料。

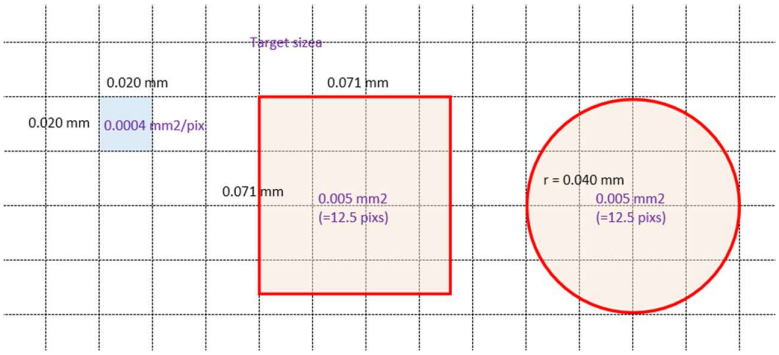
3.2.7.6. Defects can be checked, removed (manual inspection station) and reported with winder length syncing that is accurate down to the 1 meter. 缺陷可以检查，删除(手动检查站)和报告的卷长度同步精确到 1 米。

3.2.7.7. Gore prefers to use adjustable mounting brackets on illumination units and camera beam. 戈尔优选照明装置和相机光束上使用可调节的安装支架。

3.2.7.8. HMI can display a running defect map for live visualization of defects and qualification of material. HMI 可以显示运行缺陷图，实时可视化缺陷和材料的鉴定。

3.2.7.9. Camera system consists of camera and lighting. With the lighting, if there is foreign object on the membrane, it can be recognized as a shadow, and if there is a hole in the membrane, it can be recognized as bright light. In order for the camera to recognize defects, there are two processes: the primary process is brightness (darkness) judgement, and the secondary process is size judgement. We can define these values as a process set point for camera inspection for detection. If something is found that exceeds these judgement criteria, the camera will recognize it as unusual (defect). After the detection, all defects must be classified into some defect mode. For this purpose, we define defect modes such as “large foreign object”, “Pinhole”. There are many characteristics which we can utilize for definition of defect mode (e.g., Area, Length, Peak brightness, Aspect ratio, Area ratio, etc.). Proper definitions may require vendor support to ensure each defect mode is classified correctly. 摄像系统由摄像和照明两部分组成。在光照下，如果膜上有异物，可以被识别为阴影，如果膜上有洞，可以被识别为亮光。为了让相机识别缺陷，有两个过程:首要的过程是亮度(黑暗)判断，次要的过程是尺寸判断。我们可以将这些值定义为用于相机检测的过程设定点。如果发现了一些超出这些判断标准的东西，照相机将识别它为不寻常(缺陷)。在检测后，所有的缺陷都必须归类到某种缺陷模式中。为此，我们定义缺陷模式，如“大异物”，“针孔”。我们可以利用许多特性来定义缺陷模式(例如，面积，长度，峰值亮度，长宽比，面积比等)。正确的定义可能需要供应商的支持，以确保每个缺陷模式被正确分类。

Table/Figure 3.1 Comparison between resolution and target defect size



3.2.7.10. Shall be able to view full material width up to 800mm. 需要检测料带宽度达到 800 mm.

3.2.7.11. Light's lifetime should be > 3 years.

3.2.7.12. Camera inspection system should have Defect Statistics function, it can display overall defect count or data trends in graphic form, e.g. sorted by defect type

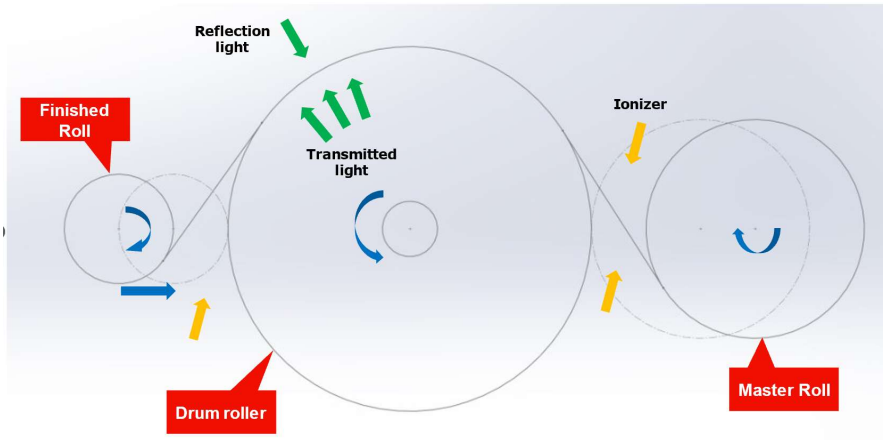
3.2.7.13. Machine shall inspect in only the forward operating direction. 只在材料前进时进行检验

3.2.7.14. "Jog" mode will be disabled in automatic mode. 点动模式在自动模式下关闭

3.2.8. Manual inspection station 人工检验工站

3.2.8.1. Shall have certain distance for inspection. To be proposed by supplier then confirmed by Gore. 应保留一定的检查距离。由供应商提议，然后由 Gore 确认.

3.2.8.2. Operator will eliminate product defects manually when stops at target stop position. The station is equipped with a Drum roller for smooth movement of the material. For your reference, please see below draft drawing. It shows the visual check position. 当停在目标停位时，操作人员将手动消除产品缺陷。工位设计了一个滚筒，使物料能平稳移动。参考如下草图。它显示目视检查位置。



3.2.8.2.1. The Drum roller shall be made of transparent material (Acrylic is preferred) with a sufficiently smooth and wear-resistant surface. 滚筒应采用透明材料制成（首选 Acrylic），表面足够光滑、耐磨。

3.2.8.2.2. The Drum roller could be an idler wheel, which means that it does not actively rotate, but passively rotates with the action of materials or other external forces. The supplier shall decide independently whether to install the synchronous servo motor on the drum roller to realize the synchronous operation of multiple rollers on the equipment 滚筒可能是一个惰轮，这意味着它不会主动自转，而是被动地随着物料或其他外部力的作用而旋转。供应商应自主决定是否要安装同步伺服马达在 drum roller 上，以实现设备上的多个辊同步运行.

3.2.8.2.2.1. If not equip with a sever motor, then it should equip a stopper cylinder, when stop signal activated the drum roller stop moving immediately. 如不是伺服驱动，应加装制动气缸，当停止信号激活时滚筒立即停止移动。

3.2.8.2.3. It is necessary to perform a static balancing test on the Drum roller. This means that during the manufacturing process, the mass distribution of the roller must be even so that no rotation occurs when stopped at any angle. 对滚筒进行静平衡测试是必要的。这意味着在制造过程中，辊轮的质量分布必须均匀，以便在任何角度停止时都不会发生自转。

3.2.8.2.4. The rotation resistance of the Drum roller should be as small as possible, which directly affects the performance of the roller. To reduce rotational resistance, you can consider the following: 滚筒的转动阻力应尽可能小，这直接影响辊轮的性能。为了降低转动阻力，您可以考虑以下几点：

1) Low-resistance bearings: Choose low-friction, small-diameter bearings to reduce rotational resistance. 低阻力轴承：选择低摩擦、小直径的轴承，以减少转动阻力。
2) Lightweight roller: Adopt reasonable design and use lightweight materials to reduce the inertia and resistance of the roller. 轻重量的辊轮：采用合理的设计和使用轻量级材料，以减少辊轮的惯性和阻力。

3.2.8.2.5. The station is equipped with transmitted light from the bottom of the material for better visibility during inspection. That means the light source shall be installed in the Drum roller. 该站配备了来自材料底部的透射光，以便在检查时获得更好的可视性。 这意味着光源应安装在滚筒中。

3.2.8.2.6. A active cooling system or equip with heat sink to LED light to prevent light damage due high temperature. 主动冷却系统或配备散热片，以防止 LED 灯因高温而损坏。

3.2.8.2.7. Gore's experience for the transmitted LED light: 1500~3000 lx and adjustable by changing the parameters on the HMI, the uniformity of the light should be ±20%. Gore recommend LED is: LNSD-1000SW-DV2SP (Maker: CCS), for your reference. 戈尔对 LED 灯的经验:透射光的照度为 1500~3000 lx，通过改变

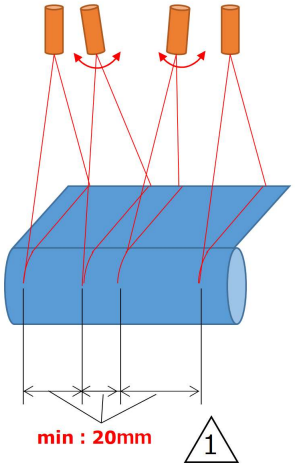
HMI 上的参数可调，光均匀度为±20%。戈尔推荐的 LED 是: LNSD-1000SW-DV2SP (Maker: CCS)，设备供应商可参考以上信息，自行选型。

3.2.8.2.8. The transmitted light source and drum roller are designed to be installed in a way that allows for quick replacement. 透射光源和滚筒的安装方式应便于快速更换。

3.2.8.2.9. A reflection light should at place from the top of web to help operator visual check the defects. Gore's past experience for the reflection light: 1000~2000 lx and adjustable, the uniformity of the light should be ±20%. Gore recommend is Z-208LEDSL (Maker: Yamada). 应在适当的位置安装反射光，以帮助操作人员检查缺陷。戈尔过去的经验对于反射光:1000~2000 lx 且可调，光的均匀度应在±20%。Gore 推荐的是 Z-208LEDSL (Maker: Yamada)。

3.2.8.3. This visual inspection station is equipped with a laser pointer group (incl. 5 laser pointers) for pointing any defects or points of interest. 该站配备激光笔组（包括 5 支激光笔），用于指示任何缺陷或感兴趣的点。

3.2.8.3.1. The position of the laser pointer can be moved in the Cross-web direction and has a scale. The minimum distance between two adjacent laser Pointers is 20 mm. 激光笔的位置可以在 Cross-web 方向移动并有刻度。相邻的两只激光笔之间的最小距离为 20 毫米。



3.2.8.4. The station is equipped with a electrostatic sensor for monitoring the static charge on film web. Gore preferred model is KEYENCE, Sensor head:SK-050 该站配备静电传感器，用于监测材料上的静电荷。当监测值不在规定范围内时，机器报警。戈尔推荐的型号是 KEYENCE 传感器头：SK-050

3.2.8.5. The station is equipped with a meter counter for tracking the length of the material inspected. The counting accuracy is controlled within 0.2 meters/roll. 该站配备计米器，用于跟踪被检材料的长度。计数精度控制在 0.2 米/卷以内。

3.2.9. Rewind Unit 收卷单元

3.2.9.1. The good part rewind shaft shall be 成品收卷轴应该

3.2.9.1.1. Capable of handling material with a maximum width of 800 mm. 需能够支持最大芯轴宽度为 800mm

3.2.9.1.2. The leaf airshaft shall be equipped with a local switch or button for inflation/deflation. Typical inflation pressure is 60psi (0.4MPa). Pressure set point should be adjustable by regulator and visible on supplied gage. 叶片式气胀轴应装有充气/放气的本地开关或按钮。通常的充气压力为 60psi（0.4MPa）。压力设定点应通过调节阀调节，并在压力表上显示。

3.2.9.2. The airflow of each ionizer is regulated by a valve with a dial. Ensure that the airflow is not affected by other equipment. 离子发生器的气流可以通过阀门调节并且带有刻度盘。确保气流不受其他设备的影响。

3.2.9.3. The rewinding tension range shall be between 3N to 30N with a ±15% (during starting, running and stopping of the machine) variation maximum. 需具备控制 3N 到 30N（总的）张力，最大误差范围不超过+/- 15%。（在设备开始，运行及暂停中）

3.2.9.3.1. A closed loop tension control system is preferred. 优选闭环张力控制系统。

3.2.9.3.2. Taper Tension: a linear percent reduction, based on roll diameter, of the tension value from roll start (3.4 or 6.4 inch unwind roll diameter) to roll end (18 inch

rewind roll diameter). 锥度张力:从卷筒开始(3.4 或 6.4 英寸收卷辊直径)到卷筒结束(18 英寸收卷辊直径)，张力值以卷筒直径为基准，线性缩小从卷筒开始(3.4 或 6.4 英寸收卷辊直径)到卷筒结束(18 英寸收卷辊直径)，张力值以卷筒直径为基准，线性缩小

3.2.9.4. Gore suggest to install at least one roll diameter sensor (ultrasonic sensor) which can accurately read the roll diameter of all the materials ± 1mm. 戈尔建议至少含有一个直径传感器能精确读取所有料卷的直径，误差不超过+/-1 mm.

3.2.9.5. The rewinding shaft must be able to run forward or reverse unwinding. 收卷轴能被正转和反转

3.2.9.6. Must have the same clutch and controller system described in Unwind Unit Section. 必须具有“放卷单元”部分中所述的相同离合器和控制器系统

3.2.9.7. Be able to jog during manual inspection. 人工检验模式下可以点动控制

3.2.9.8. The unwind spindle must include a means (scale, etc.) to visually aid the operator in keeping rolls properly positioned on the core chuck for rewinding. The zero “0” mark is to be at the aligned with the “left” of the machine's effective/active usage position. 放卷轴必须包括一种装置（刻度尺等），以直观地帮助操作员将卷筒正确定位在芯卡盘上以进行复卷。 零位“0”标记应与机器有效/主动使用位置的“左侧”对齐。

3.3. Specification Tables 规格表

3.3.1. List all speed/weight/performance criteria etc. 速度/重量/表现等目标

3.3.1.1. Automatic mode minimum running speed: >20m/min 自动检验模式下速度> 20 米每分钟

3.3.1.2. Escape ratio: < 0.2% 漏杀：< 0.2%

3.3.1.3. AOI Overkill Ratio: < 2% 过杀：< 2%

3.3.1.4. Product exchange time maximum: 24 mins 产品最大换线时间 24 分钟

3.3.2. Product Specifications:

Table 3-2: Put product matrix

Item	Membrance Name	PN#	SIZE	Note
1	TPU	SL201-T0.008MM	1m W*550m L	available in SZBAN warehouse
2	PI nanofiber	NI-075-V1D-700	700mm W*100m L	available in SZBAN
3	PU nanofiber	GXC-NU-7#	800mm W*100m L	available in SZBAN

	RAW MATERIAL PARAMETER	SPECIFICATION
1.	Material composition	Membrane (TPU; ePE; Beta_PI/PU nanofiber)
2.	Master roll web width	300~800 mm
3.	Master roll diameter	84~500 mm
4.	Core size -Master roll	3 inches
5.	Winding length -Master roll	5~3000 m
6.	Roll weight -Master roll	Max. 30 kg
7.	Core size -Finished roll	3 inches
8.	Roll diameter-Finished Roll	84~250 mm
9.	Roll web length -Finished roll	1~300 m
10.	Roll weight -Finished roll	Max. 15 kg (Typically Max. 5 kg)

Recommend Web Tension to raw materials:

材质	part number	Recommend Web Tension
TPU	SL201-T0.008MM	供应商使用 8~10 kg/m^2,设备不同根据实际效果调整
PI nanofiber	NI-075-V1D-700	零张力收卷
PU nanofiber	GXC-NU-7#	
Porous ePE	P261108A-A1	as low as possible, preferably no nip-rolls should be used (or lower nip pressure). advise to test the properties before and after re-winding to make sure they remain the same.
Porous ePE	P260919A-B1	
LB ePE	P200621A-A1-00-A10	
Dense membrane	P270529A-B1-00-A03	

Remark: If the web tension is too high, longitudinal creasing and membrane web deformation may be caused.

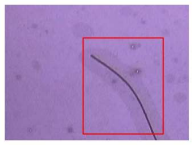
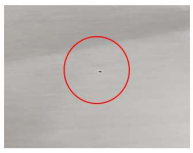
3.3.3. Defect Specifications : 不良说明

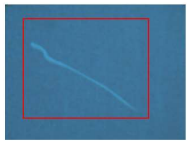
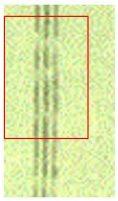
Table 3-4: Defect Specifications

Detector	Defect mode	Spec	Automatic line stop	Note
Camera	Black dot (large)	30 pcs/m2		A roll which has >30 pcs/m2 will be scrapped. This is existing spec for TPV956. This number is average number calculated after inspection of a roll.

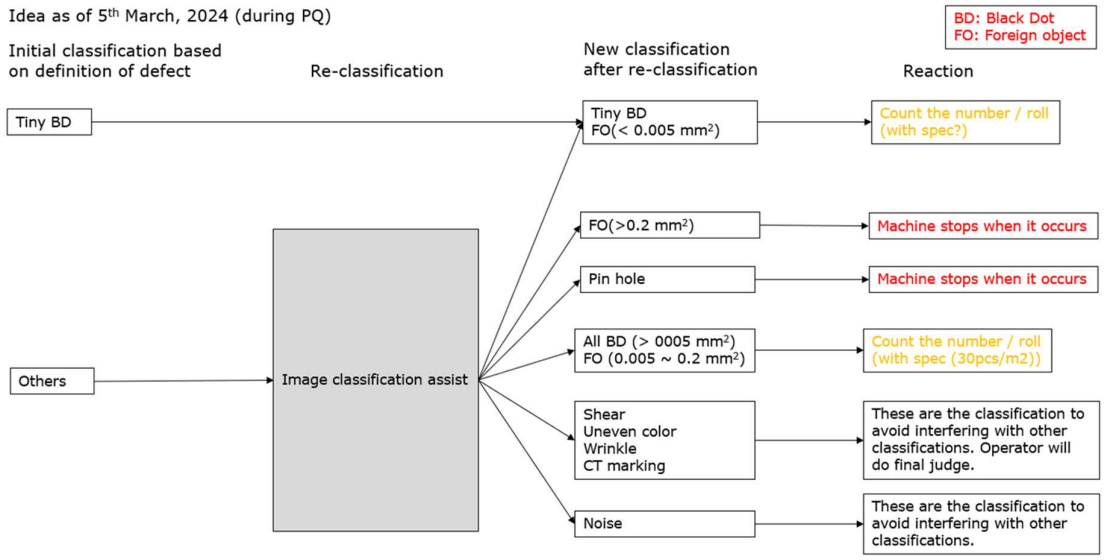
Camera	Foreign object (large) (>0.2mm²)	0 pcs/roll	○	
Camera	Foreign object (middle) (0.005~0.2mm²)	Will be created in FAT		If the total # of foreign object (>0.005mm²) exceeds the spec, the roll will be scrapped. This number is average number calculated after inspection of a roll.
Camera	Foreign object (very small) (< 0.005 mm²)	No spec		Just a monitoring
Camera	Pin hole	0 pcs/roll	○	This is existing spec for TPV956.
Camera	shear	No spec		Will create this classification to increase accuracy of classification for the other mode (Black dot, Foreign object, Pin hole) 将创建这样的分类来提高分类的准确性,另一种模式(黑点、异物、针孔)
Camera	Black spot (tiny)	No spec		Will create this classification for future reference. (e.g. Use the data when we get complaint from customer)
Camera	Dense defects	Do we need a spec here?	○	If lots of defect occur within 80mmCWx100mmDW (this is just an example), we can consider scrapping the area. We can select defect modes which should be included to judge "dense defect". (e.g. foreign object (middle) + black dot + black spot)
Camera	Large amount	Depend on defect mode	○	This mode is counted when a large number of defects occur at once and the software cannot keep up with the processing. If the cause is sagging of the membrane, operator will ignore it. 这种模式是在同时出现大量缺陷，软件无法跟上处理的情况下进行统计。如果原因是膜塌陷，操作者会忽略。
Camera	Uneven color	0 pcs/roll		Operator will judge the defect width. Will create this classification to avoid taking images of this mode all the time.
Operator	Uncategorized			Take a sample
Operator	Foreign object (>0.2mm2)	0 pcs/roll		Ref. BS-0700 If the camera misses it, the operator will stop the machine.
Operator	Pin hole	0 pcs/roll		If the camera misses it, the operator will stop the machine.
Operator	Crease	0 pcs/roll		Mark the defect area on the roll after completion of visual inspection. (cut it off during roll cut process)
Operator	White/Black line	0 pcs/roll		Mark the defect area on the roll after completion of visual inspection. (cut it off during roll cut process)
Operator	Uneven color	0 pcs/roll		Mark the defect area on the roll after completion of visual inspection. (cut it off during roll cut process)

Operator	CT marking	0 pcs/roll		Option1: Stop the line and cut it off. Option2: Mark the defect area on the roll after completion of visual inspection. (cut it off during roll cut process) Operators select either option depending on the winded roll length.
				Take a sample in the following case
				1. When the camera judges differently from operator. (e.g., the camera says OK, but operator recognizes it as defect).
				2. New mode that cannot be judged by the SOP

Defects Name	Defective Pics	Specification
Particle		Area≤0.005mm²
Fiber on membrane		Area≤0.005mm²
Pin Hole		Not Allowed
Contamination（Fingerprint，Grease stain，Watermark，Ink print etc.）		Not Allowed

Defects Name	Defective Pics	Specification
Wrinkle		AOI must capable of detecting wrinkle. Gore provide samples for testing
Press Mark		AOI must capable of detecting press mark. Gore provide samples for testing
Scratch		AOI must capable of detecting press mark. Gore provide samples for testing
Slack		Nice to have this inspection capability for AOI
Dots（Black/White）		Area≤0.02mm²
Line（Black/White）		Not Allowed

3.3.4. Re-classification: Process is as figure below shows.



3.3.5. AOI Machine Criteria

No.	Category	Item	Criteria	Note
1	Productivity	**Spec** for foreign particles (>0.005mm2) and **Yield** with the spec	Establish new internal spec with estimated yield.	Expected yield for visual inspection of TPV956 is 97.9%. (Current master setting in E1)
2	Camera inspection capabilities	**Accuracy of classification** of black dot, foreign object (>0.2 mm^2, >0.005 mm^2), and pinholes	>= 95% accuracy for black dot, foreign object (>0.2 mm^2, >0.005 mm^2), and pinholes (Pass GRR test), No wrinkle after rewinding	Overkill ratio: ⩽ 2% by single defect @ 95% confidence level. Escape ratio: < 0.2% @95% confidence level. *Monitor the accuracy for the other defect mode.
3	Downtime	Frequency of **unexpected line-stop**	Frequency of line-stop caused by misjudgment < 1 times / 1 hour (< 1 times / 300 m at 5 m/min)	Followed same criteria for TPV997. Typical line-stop frequency is 2.5 times/1000m. *This is necessary line-stop to remove defects. This data is based on recent 10 WO. 1 line stop takes about 5 – 10min. 2 time / hour seems too many.
4	Process control	**SOP** (Process card and Data sheet)	Resolve all uncertainties on process card and data sheet by getting feedback from GROP	
5	MES	**MES system**	MES outputs correctly.	Use dummy data to confirm if MES judges pass/fail correctly.
6	Calibration	**Correlation** between **actual** size (laser microscope) and the size detected by **camera** for larger size range than 0.005mm^2.	Understand correlation statistically for the range of 0.04 ~ 0.24 mm^2.	

3.4. Main controller and Motion Drives. 主控制器和运动控制

3.4.1.1. PC based control system is preferred. The source codes of motion controller must not be password-protected, and the source codes must be created entirely in English.

3.4.1.2. The PLC system shall be the master control processor for the machine.

3.4.1.3. The industrial PC shall have two Ethernet cards installed, one for the machine control network and one for the GORE internal network. 工控机将会安装两个以太网卡, 一个用于机器控制网络, 一个用于戈尔内部网络。

3.4.1.4. The local brand drive and motor solution is preferred. 马达驱动控制优先考虑选择国产品牌。

3.4.1.5. A minimum of 25% spare digital points and 20% spare analog points shall be provided. 硬件设计上，最少还有剩余 20%的数字 IO 和模拟量接口可以利用。

3.4.1.6. USB and Ethernet convenience ports should be provided on the side or rear of the main HMI enclosure. (HMI). 在主 HMI 盒子侧面或背面留有 USB 和以太网接口。

3.5. HMI Specification (GUI) 人机界面技术规格

3.5.1. Dell brand touch monitor is preferred if controller is PC based.

3.5.1.1. The HMI enclosure should be provided with a support tray for keyboard and mouse that can be utilized for touch screen navigation, recipe edit functions, screen login, etc. 需要配置鼠标和键盘，以及设计放置它们的托盘。鼠标和键盘连接电脑，可用来操作触摸显示屏的导航栏，配方编辑等

3.5.1.2. The mouse and keyboard shall both be wired type (not wireless)使用有线鼠标和键盘

3.5.1.3. The machine must provide a dedicated surface for the operator to use the mouse on 设备上要提供一个鼠标专用表面以便操作员使用

3.5.2. The HMI will consist of a series of screens that allow easy set-up and control of the machine. Navigation through the screen hierarchy should be intuitive. In addition, color and font schemes should be consistent throughout. 人机界面将由一系列屏幕组成, 使机器易于设置和控制。通过导航的屏幕层次结构应该是直观的。此外, 颜色和字体方案应始终保持一致。

3.5.3. The HMI should have the ability to switch display language between English and Chinese. This ability to switch language must be available from all screens. 所有的 HMI 工程画面语言能中英文切换。

3.5.4. The HMI screen will indicate to the operator why the machine is stopped (ie. location of rejected part, bad section of registration, tension fault, etc.) HMI 屏幕需要显示出机器为什么停止 (即被拒绝零件的位置, 注册的坏品, 张力故障等)

3.5.5. The HMI shall have a machine overview screen which will display active values from components such as force transducer, part counting, roll diameter,

etc. 人机界面将有一个机器整体设计图的显示画面, 可显示元件的值, 如力传感器, 零件计数, 卷轴直径等等。

3.5.6. The supplier shall provide their own Development Software for the HMI, PLC, and drives. Customer will supply the necessary Run Time versions of the software if necessary. 供应商应为人机界面、PLC 和驱动器提供自己的开发软件。客户将提供必要的运行时间版本的软件。

3.6. Recipe Specification 配方说明

3.6.1. The HMI shall incorporate a recipe feature, where a recipe can be created, copied, saved, renamed, etc. 人机界面应包含配方功能, 它可以创建、复制、保存、重命名等。

3.6.2. Shall have the ability to accept string data value in order to automatically select predefined machine recipe. For example, customer system will send TPU ####, in string value to supplier PLC, the machine will automatically vision/machine recipe for TPU ####, and not allow operator to manually deviate from recipe. 应具有接受字符串数据值的能力, 以便自动选择预定义的机器配方。例如客户系统将 TPU ####,的字符串值发送给供应商 PLC, 机器将自动为 TPU ####,的视觉/机器配方, 不允许操作员手动偏离配方。

3.6.3. The look, feel, and ease of use of HMI recipe should be designed by machine vendor. Ask the GORE electrical engineer for their advice and opinion while in design phase. HMI 配方的外观和易用性应由机器供应商设计。在设计阶段向戈尔电气工程师征求他们的建议。

3.6.4. The machine should be capable of handling up to 60 recipes. 最少要有 60 个配方可利用。

3.6.5. Must have the ability to create new recipes using the HMI. Creating a new recipe must not require the use of a computer being connected to the PLC.必须具有使用 HMI 创建新配方的能力。创建新配方一定不需要使用连接到 PLC 的计算机。

3.6.6. The following table lists permissions and access rights associated with each role. 下表列出了与每个角色关联的访问权限

Table 3-1: HMI Permissions

ROLE / MENU	OPERATOR (DEFAULT ROLE)	ENGINEERING
Log-in & Password Required 登录&密码需求画面		✓
Navigation screens	✓	✓

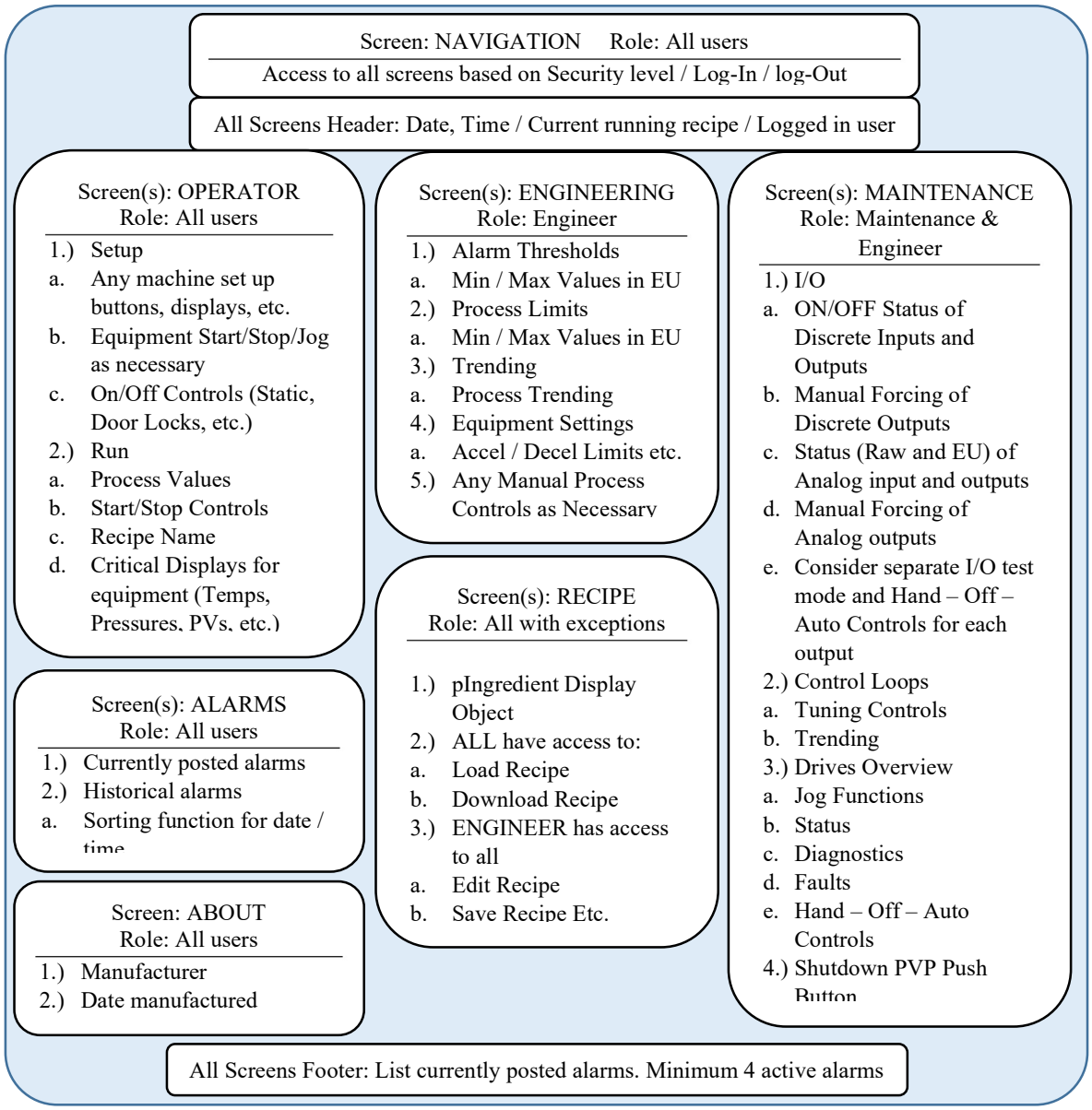
导航画面		
Operation screens 操作画面	✓	✓
Alarm Summary 报警统计	✓	✓
Alarm History 报警历史	✓	✓
Recipe (Load & Run only) 配方（加载&运行）	✓	✓
Recipe (Editing & management) 配方（编辑&管理）		✓
Calibration 校准		✓
Engineering / Maintenance screens 工程/维修画面		✓
Change password 密码更改		✓

3.6.7. Security levels shall be（安全等级）:

3.6.7.1. Operator 操作员

3.6.7.2. Engineer 工程师

3.6.8. The following flowchart lists HMI structure (the HMI structure shall be determined upon consult with vendor): 流程图列出了 HMI 的结构 (HMI 结构应在与供应商协商后确定,下图仅供参考)



3.6.9. Control system schematic 控制系统图

3.6.9.1. Supply should provide the system schematic to GORE, GORE engineer will check if it is work or not.

3.6.10. IP Addresses IP 地址

3.6.10.1. ATTENTION: During the design phase, the machine contractor must compile a list of all components that require an IP address and forward it to Gore. All the IP addresses in the machine are preset by Gore! 在设计阶段, 承包商必须列出所有需要 IP 地址的组件并将其转发给戈尔。机器中所有的 IP 地址都是由戈尔预设的!

3.6.10.2. Machine built for U.S. installation: IP Address List 为美国建造的机器 IP 地址清单

3.6.10.2.1.Machine Network: **10.0.52.XXX** 设备端网络： 10.0.52.XXX

Item	Starting Address	Final Address
Control PC 控制电脑	1	19
PLC 可编程控制器	20	49
Field I/O 现场 I/O 总线	50	99
HMIs 触摸屏	100	129
Drives 马达驱动器	130	179
Devices (Switches) 智能装置（开关）	180	250
LAPTOP Comms	250	255

3.6.10.2.2.Gore Network: Dynamic addressing 戈尔内部网络：动态寻址

3.6.10.3. Machine built for SZ installation: IP Address List 深圳机器的 IP 地址清单

3.6.10.3.1.Machine Network: 深圳机器的 IP 地址清单

Item	Starting Address	Final Address
Control PC 控制电脑	1	19
PLC 可编程控制器	20	49
Field I/O 现场 I/O 总线	50	99
HMIs 触摸屏	100	129
Drives 马达驱动器	130	179
Devices (Switches) 智能装置（开关）	180	250
LAPTOP Comms	250	255

3.6.10.3.2.Gore Network: 157.204.171.XXX 戈尔内部网络：157.204.171.XXX

3.7. GORE MES System

3.7.1.1. Machine must include a bar code scanner with appropriate storage location that provides the operator with easy access. 机器必须包括条形码扫描仪，并且具有适当存放位置，以使操作员易于访问。

3.8. Material, Finish & Coating Selection 材料、收尾&喷涂的选择

3.8.1. The selection of standard components must be according to GORE component brand list. 标准元件的选择必须按照戈尔标准件品牌清单。

3.8.2. Main body of the machine frame should be made by standard aluminum profiles with standard fittings. 机架的主体应采用标准铝型材和标准配件制造。

3.8.3. Harden and grinded shaft only can be remanufactured from standard shaft which brand is described in GORE component brand list. 硬化和磨削轴只能采用标准轴进行加工，标准轴品牌在戈尔标准件品牌清单有描述。

3.8.4. Precise holes (H7): Ensure the quality of H7 holes, we do not accept the holes manufactured in line cutting. All H7 holes only can be finished in milling machine with reamer or boring tool. And before delivery it must be measured by plug gauge. 精密孔（H7）：为确保 H7 孔的质量，我们不接受线切割制造的孔。所有的 H7 孔只能用铰刀或镗刀在铣床上完成。在交货前必须用塞规测量。

3.8.5. Chamfer: Prior to surface treatment of a part all sharp edges must be chamfered according to the drawings. Chamfer can't be finished by burnish tool or knife manually, because it can't ensure all chamfer is the same. 倒角：在对零件进行表面处理之前，所有的锐边必须根据图纸进行倒角。倒角不能用打磨工具或刀手工完成，因为不能保证所有倒角都是相同的。

3.8.6. Thread tapping: In order to ensure the quality of the thread, we don't recommend to use manual tapping. The thread in the parts must be vertical. The Class of the thread is 6H in Gore. 螺纹攻丝：为了保证螺纹的质量，我们不建议使用手工攻丝。零件中的螺纹必须是垂直的。Gore 的螺纹等级要求为 6h。

3.8.7. Surface treatment for Stainless Steel sheet metal parts: Glass blast with grain size 200#.不锈钢钣金件表面处理：采用粒度为 200 目的玻璃珠喷丸处理。

3.8.8. Surface treatment for Aluminum metal parts: Glass blast with grain size 200# then Clear anodized. 铝合金零件表面处理：采用粒度为 200 目的玻璃珠喷丸处理，然后进行阳极氧化处理。

3.8.9. Surface treatment for Normal Steel metal parts: blackening. 普通钢金属零件的表面处理：发黑。

3.8.10. Powder painting for Normal Steel sheet metal parts: color RAL 7035, gloss 80 普通钢钣金件粉烤漆：颜色 7035，光泽 80

3.9. Hardware 硬件

3.9.1. Refer to "03_Gore Preferred Component Brand List" 参考"03_Gore Preferred Component Brand List"

3.10. Calibration 校准

3.10.1. Calibration certification for all meters, gauges, sensors, and cameras the machines use must be provided to the appropriate location: 必须将机器使用的所有仪器，仪表，传感器和摄像机的校准证书发送给相对应的工厂

3.10.1.1. Machine built for SZ installation certifications will be delivered to W.L. Gore & Associates (Shenzhen) Co., Ltd. 深圳机器的证书发给戈尔深圳有限公司

3.10.1.2. Machine built for U.S. installation certifications will be delivered to W.L. Gore & Associates, Inc (Appleton North).美国机器的证书发给戈尔美国公司(Appleton North).

3.10.1.3.

3.11. Safety Requirements 安全要求

3.11.1. Through emergency stop no dangerous movements may be triggered. 按下急停按钮不能触发任何危险动作。

3.11.2. When releasing emergency stop the actuators should remain in their last position. 当释放急停按钮时，执行器应保持在其最后位置。

3.11.3. If possible, all actuators should stay in the safe position. 如果可能的话，所有的致动器都应该保持在安全位置。

3.11.4. Other safety requirements reference to General Specifications for Mechanical Equipment — section 15.safety measures. 其他安全要求请见机械设备通用规范的第十五节安全措施。

3.11.5. Machine must follow below applicable standards: 机器必须遵循以下适用标准：

	Standard No.	Standard Description
01	GB/T 15706-2012 ISO12100-2010	机械安全 设计通则：风险评估与风险减小 Safety of machinery-General principles for design-Risk assessment and risk reduction
02	GB/T 16856-2015 ISO/TR 14121-2:2012	机械安全 风险评估：实施指南和方法举例 Safety of machinery-Risk assessment-Practical guidance and examples of methods
03	GB 16754-2008 ISO 13850-2006	机械安全 急停 设计原则 Safety of machinery-Emergency stop-Principles for design
04	GB 23821-2009 ISO 13857-2008	机械安全 防止上下肢触及危险区的安全距离

		Safety of machinery-Safety distances to prevent hazard zones being reached by upper and lower limbs
05	GB/T 8196-2003 ISO 14120-2002	机械安全 防护装置 固定式和活动式防护装置设计与制造 一般要求 Safety of machinery-Guards-General requirements for the design and construction of fixed and movable guards
06	GB/T 18831-2010 ISO 14119-1998	机械安全 带防护装置的联锁装置 设计和选择原则 Safety of machinery-Interlocking devices associated with guards-Principles for design and selection
07	GB/T 19670-2005 ISO 14118-2000	机械安全 防止意外启动 Safety of machinery-Prevention of unexpected start-up
08	GB/T 7932-2003 ISO 4414-1998	气压传动与系统相关的一般规则
09	GB/T 16855.1-2008 ISO 13849.1-2006	机械安全 控制系统有关安全部件 第 1 部分：设计通则 Safety of machinery-Safety-related parts of control systems-Part 1: General principles for design
10	GB/T 16855.2-2007 ISO 13849.2-2003	机械安全 控制系统有关安全部件 第 2 部分：确认 Safety of machinery-Safety-related parts of control systems-Part 1: Validation
11	GB/T 5226.1-2008 IEC 60204-1:2005	机械电气安全 机械电气设备 第人部分：通用技术条件 Electrical safety of machinery-Electrical equipment of machines-Part 1: General requirements
12	GB4208-2008 IEC60529	外壳防护等级
13	CEI/IEC 1000-1-1-1992	电磁兼容性（EMC） 第 1 部分：总则第 1 部分：基本定义和术语的应用和解释 Electromagnetic compatibility (EMC) Electromagnetic compatibility (EMC) Part 1: General Section 1: Application and interpretation of fundamental definitions and terms
14	IEC 61000-1-2 Edition 2016-04	电磁兼容性（EMC）－ 第 1-2 部分：总则－实现电气和电子系统（包括与电磁现象有关的设备）的功能安全的方法 Electromagnetic compatibility (EMC) – Part 1-2: General – Methodology for the achievement of functional safety of electrical and electronic systems including equipment with regard to electromagnetic phenomena

3.12. Equipment Labeling 设备标识

3.12.1. All of section relate to safety must be indicated, such as “danger, electric shock”, “caution, mechanical injury”, and so on. 所有有关安全的工位都必须明确标识，如“危险、触电”、“注意、机械伤害”等。

3.12.2. All of operation component and gage must be indicated, such as button, regulator, and so on. 所有操作部件和仪表都必须明确标识，如按钮、调节器等。

3.12.3. CE Marking & Declaration of Conformity CE 认证及标识

3.12.3.1. The supplier shall be responsible for CE marking 供应商负责设备的认证及标识。

3.12.4. A label containing the following information should be attached to the equipment, adjacent to the electrical lock-out: 在设备电气锁定相邻的位置上应贴有包含下列信息的标签：

3.12.4.1. Manufacturer’s Name 生产厂家名字

3.12.4.2. Manufacturer’s Phone Number 生产厂家电话

3.12.4.3. Manufacturer’s Address 生产厂家名字

3.12.4.4. Fabrication (completion) date 生产日期

3.12.4.5. Equipment Model & Serial number 设备的型号及序列号

3.12.4.6. Equipment Power&Power supply (voltage&amp&) 设备功率及电源（电压&电流）。

3.13. Environmental Limitations 环境限制

3.13.1. The floor loading capacity is 9,800N/m² (1,000kg/m²), and vendor must consider it in machine design. 地板承重能力为 9800 N/m2（1000 公斤/平方米），供应商在机械设计时必须考虑。

3.13.2. The entrance dimension for Shenzhen location is 1900mm wide and 2300mm high. 深圳工厂的入口尺寸为 1900mm 宽和 2300mm 高。

3.13.3. The maximum pressure of compressed air in Gore facility is 0.55MPa. It’s expected that the machine will work at 85% of the air source pressure. Machine is expected only one compressed air entrance which has a regulator and pressure gage. 工厂压缩空气的最高压力为 0.55MPa。要求设备在 85%的最高气压下工作。要求整机有唯一一个带有调节阀及压力表的气源入口。

3.13.4. Power supply should follow China electricity standard. 1 phase 220V AC or 3 phase 380V AC, 50HZ. 机器电源应符合中国的电力标准。 单相 220V AC 或 3 相 380V AC，50HZ

3.13.5. Noise of machine must be less than 75dB when running normally. 正常生产情况下设备的噪音不超过 75dB。

3.14. Installation & Startup 安装与启动

3.14.1. Installation & Startup for Machine built for SZ installation: 深圳机器的安装和启动

3.14.2. Supplier shall be responsible for the off-loading, un-crating and installation of the equipment at Gores facility. Gore shall prepare the facility in accordance with the Suppliers recommendations as provided in the Supplier generated facilities drawing. Supplier shall oversee all aspects of the installation and prepare for the Site Acceptance Test (SAT). 供应商应负责设备在戈尔工厂的卸载、拆箱和安装。戈尔应根据供应商所制订的生产设施图中提供的建议来准备相关设施。供应商应监督安装和现场验收测试准备工作的所有方面。

3.14.3. Supplier's engineers, skilled trade people, and support employees shall be made available to assist with installation and startup at Gore's site as required. 供应商的工程师、技术人员和支持人员，应根据需求协助在戈尔现场的安装和启动工作。

Section 3 Compliance		**Functional Requirements**	**Signature & Date**
		If "No", list exceptions by paragraph number stating reason for exception(s), and if applicable, alternatives. 如果"否"，则用段落号码列出例外并说明理由，如果适用的话，列出备选方案。	
Yes ☐	No ☐		

4. Documentation Requirements 文件要求

4.1. Documentation Format 文件格式

4.1.1. The documentation must be supplied to W.L Gore on time in paper form and additionally as a file in PDF format. Drawings are to be passed as dwg, dxf, E-Plan, Step-file and all other files in current MS Office formats (e.g. Word, Excel). All documents and programs need to be created in both Chinese and English. 文件必须以书面形式提交给戈尔公司，并以 PDF 格式作为文件附件。图纸将转为 DWG、DXF、E-PLAY 或 STEP 文件，所有其他文件以当前 MS Office 格式（如 Word、Excel）。所有的文件和程序都需要用中文和英文来制作。

4.1.1.1. Requirements for machine built for SZ installation

4.1.1.1.1. 2 sets, hard copy, Chinese 2 套，纸质，中文

4.1.1.1.2. 1 set U drive 1 个 U 盘

4.1.1.2. Requirements for machine built for U.S. installation

4.1.1.2.1. 1 set drive 1 个 U 盘

4.2. Project Documentation Timing 设备文件的时间表

4.2.1. The following table defines the expected timeline of documentation availability for review.下表定义了应准备好的文档的预期时间表。

Table 4-1: Documentation timing 文件准备时机

Description 描述	**Design Review 设计评审**	**Factory Acceptance Test 工厂验收**	**As Installed 竣工**
Overall layout drawings (general assemblies) with major and subsystem mechanical components and design. 总布置图（总装）含主要和子系统的机械部件和设计。	Yes	Yes	Yes
A basic Standard Operating Procedure (SOP) that lists the steps and actions necessary to run the machine. 列出运行机器所需的步骤和动作的基本标准操作规程（SOP）。	Preliminary 初步	Final 最终	N/A
Blockout/Lockout/Tagout Procedures and/or isolation points. 封锁/锁定/标签的程序和/或隔离点。	N/A	Yes	Yes
Electrical and Control System Drawings/schematics, including Safety Interlocks, P & ID's, etc. 电气和控制系统图纸/示意图，包括安全联锁、P&ID 等。	Yes	Yes	Yes
HMI Screen layouts (after Design review, before FAT.) HMI 屏幕布局（在设计评审之后，在 FAT 之前）。	N/A	Yes	Yes
User manuals and documentation for all available purchased components. 所有采购件用户手册和文件。	N/A	Yes	Yes
Serial numbers for all calibrated components. 所有校准组件的序列号。	N/A	Yes	Yes
Calibration certification for all calibrated components. Calibration certification to be listed traceable in order to meet Gore requirements. 所有校准组件的校准证书。校准证书按符合 Gore 要求的可追溯清单列出。	N/A	Yes	Yes

Description 描述	**Design Review** 设计评审	**Factory Acceptance Test** 工厂验收	**As Installed** 竣工
Routine and preventive maintenance procedures and recommended intervals. 日常和预防性维护程序和建议的间隔。	N/A	N/A	Yes
Calibration intervals / documented procedures for systems & components as needed 对系统及元件按需要列出校准间隔和流程	N/A	N/A	Yes
A complete “as built” Bill of Materials (BOM) and a recommended critical spare parts list including the original equipment manufacturer (OEM) and their P/N for purchased items. 一个完整的“竣工”材料清单（BOM）和一个推荐的关键备件清单，包括原始设备制造商（OEM）及其采购件号。	Yes	Yes	Yes
Material Certifications 材料证书	N/A	Yes	Yes
All completed control system software on removable media 控制系统软件在可移动介质上	N/A	Yes	Yes
Any software or other interface devices that are required to maintain, setup, modify, troubleshoot, calibrate, or operate the equipment, including any licenses, maintenance agreements, system manuals, disks, hardware keys, software passwords, fixtures, etc. 任何在维护、安装、修改、故障排除、校准或操作设备时需要的软件或其他接口设备，包括任何许可证、维护协议、系统手册、磁盘、硬件密钥、软件密码、固定装置等。	N/A	Yes	Yes

4.3. Document / Design Approval 文件/设计批准

4.3.1. Any purchased parts or materials that are long lead time items which could affect the timely production of the total system should be considered and Supplier shall notify W L Gore of these specific items. If the purchase is required before the drawings have been approved, the Supplier shall obtain written authorization from W L Gore for such purchases. 任何长交货期的采购件或材料，可能会影响整个系统的及时生产，供应商应考虑并把这些特定的料件通知戈尔。如果在图纸被批准之前需要购买，供应商应从戈尔获得书面授权以购买此类产品。

4.3.2. Any work performed not in accordance with Gore’s approved drawing set shall require rework at the Supplier’s expense to meet the design agreed upon in the

approval drawings. 任何不符合 Gore 批准的图纸集的工作，都需要供应商承担费用进行返工，以满足批准图纸中所约定的设计.

4.3.3. Documentation Requirements Table 文件需求表

Section 4 Compliance 符合性		**Documentation Requirements 文件需求**	**Signature & Date** 签署&日期
		If "No", list exceptions by paragraph number stating reason for exception(s), and if applicable, alternatives. 如果"否"，则用段落号码列出例外并说明理由，如果适用的话，列出备选方案。	
Yes ☐	No ☐	Machine data sheet 机器参数表	
Yes ☐	No ☐	Machine footprint and installation dimension. 机器的安装尺寸和占用面积。	
Yes ☐	No ☐	Assembly drawings-Machine 整机装配图	
Yes ☐	No ☐	Assembly drawings-section 工位装配图	
Yes ☐	No ☐	Mechanical part drawings 机械零件图	
Yes ☐	No ☐	Electrical diagrams 电气图	
Yes ☐	No ☐	I/O list I/O 清单	
Yes ☐	No ☐	Pneumatic diagrams 气动原理图	
Yes ☐	No ☐	PLC program or Motion control source codes PLC 程序 或 运动控制代码	
Yes	No	HMI program	

☐	☐	HMI 程序	
Yes ☐	No ☐	Operation manual 操作手册	
Yes ☐	No ☐	Maintenance plan 保养计划	
Yes ☐	No ☐	Critical components list 关键元件清单	
Yes ☐	No ☐	Spare parts list 备件清单	
Yes ☐	No ☐	Standard components documents 标准元件文件	
Yes ☐	No ☐	Risk assessment documents 风险评估文件	
Yes ☐	No ☐	Electrical measurement report according to EN60204-1 基于 EN60204-1 的电测报告	

5. Other Requirements 其他要求

5.1. Spare Parts 备件

5.1.1. Spare part list and spare parts will be delivered by the equipment supplier. 备件清单和备件都将由设备供应商提供。

5.2. Machine Accessories 机械配件

5.2.1. Any required machine accessories will be delivered by the equipment supplier. 任何必要的机器配件将由设备供应商交付。

5.3. Service Requirement. 服务要求

5.3.1. The equipment must be setup with any necessary hardware/software to enable remote equipment troubleshooting by supplier. Remote access to the equipment must be limited to periods that are supervised by Gore representative. 设备必须安装任何必要的硬件/软件, 以便供应商可以远程设备故障排除。 远程访问设备必须限制在戈尔代表监督的期间。

5.3.2. Supplier must respond to requests for support within 24 hours during machine warranty period. 供应商必须在机器保修期内 24 小时内对支持请求作出响应。

5.4. Training 培训

5.4.1. Machine built for U.S. installation Training Required: 美国机器的培训要求

5.4.1.1. No training will be required (on site or virtually) for machine built for U.S. installation.对于为美国安装而建造的机器，无需培训（现场或虚拟）

5.4.2. Machine built for SZ installation Training Required: 深圳机器的培训要求

5.4.2.1. The vendor is responsible for training the following group of people of the client (W.L.Gore): 供应商必须培训以下戈尔团队成员

5.4.2.1.1. Project team consisting of:项目团队组成

5.4.2.1.1.1. Project Champion 项目负责人

5.4.2.1.1.2. Electrical Contact 电气工程师

5.4.2.1.1.3. Mechanical Contact 机械工程师

5.4.2.2. The training must include the following topics: 培训内容包括：

5.4.2.2.1. Creation of new recipes 配方创建

5.4.2.2.2. Operation of Double stack sensor 材料堆叠检测操作

5.4.2.2.3. Information about residual risks 残留的风险信息

5.4.2.2.4. Troubleshooting 故障处理

5.4.2.3. The initial training will be part of the FAT. The main on-site training (Gore SZBAN plant) should be performed at the SAT. (SAT= Site Acceptance Test). The training must be done in English or Chinese. 首次培训将是 FAT 的一部分。 主要现场培训应在 SAT (深圳宝安工厂) 进行。 培训语言是中文或英文。

5.5. Other 其他

5.5.1. All of measurements use SI units, such as dimension (m, mm), weight (kg, t), pressure (Pa, MPa). 所有测量使用 SI 单位, 例如尺寸 (m, 毫米), 重量 (公斤, t), 压力 (Pa, MPa)

Section 5 Compliance		**Other Requirements**	**Signature & Date**
		If “No”, list exceptions by paragraph number stating reason for exception(s), and if applicable, alternatives. 如果“否”，则用段落号码列出例外并说明理由，如果适用的话，列出备选方案。	
Yes	No		

☐	☐		

6. Project Acceptance 项目接受

6.1. General 概述

6.1.1. Project acceptance is dependent upon successful completion of FAT, SAT and provision of documentation as outlined in §4 documentation requirements.项目接受取决于成功的完成了 FAT,SAT 以及提供所有第四章中所列的文件

6.1.2. A Gore safety associate will review the machine for compliance to this specification, general workmanship, applicable regulatory standards and all Gore safety requirements. Release of the machine to Gore is contingent on approval of the Gore safety associate.一位戈尔的安全工程师将检查设备是否符合此规格书中定义，通用工艺，适用的监管标准和所有戈尔的安全要求。放行此设备需要此安全工程师的批准。

6.2. FAT-Factory Acceptance Test 工厂接受测试

6.2.1. The following testing and acceptance criteria shall apply unless a more stringent criteria is stated elsewhere in the contract.以下测试和接受标准会被应用除非有合同中定义的其它更严格的接受标准。

6.2.2. Testing shall be at supplier's designated location. Prior to the arrival of GORE's representative(s) for the FAT, the pre-FAT should be done and documented.测试在提供商的场所进行。在戈尔的代表参与正式测试之前，预先的测试需要被完成并且记录。

6.2.3. For test content, please refer to the FAT protocol.关于测试内容，请参照工厂接受测试方案

6.2.4. The FAT protocol is provided by Gore. 工厂接受测试方案由戈尔提供

6.2.5. The FAT should be conducted by Gore representative(s), and done together with the vendor's technicians.工厂接受测试需要由戈尔的代表及提供商的人员一起完成。

6.2.6. The FAT report should be written by Gore project champion.工厂测试报告需由戈尔项目负责人签收

6.2.7. Authorization for shipment shall be granted by designated GORE contact upon acceptance at manufacturer's plant. Authorization for shipment does not signify final machine acceptance nor does it release the supplier from any specification requirements, unless expressly stated in writing by GORE's representative.允许发货需要由戈尔的指定联系人根据接受的工厂测试结果而做出。允许发货不代表最终设备接受，也不代表提供商不用满足规格书中的其它要求除非有由戈尔的代表的书面特别说明。

6.3. SAT-Site Acceptance Test 现场接受测试

6.3.1. The SAT shall serves as the vehicle for final machine acceptance.现场接受测试是为设备最终接受的方式

6.3.2. Testing shall be at GORE's designated location.测试在戈尔指定的地点进行

6.3.3. For test content, please refer to the SAT protocol.测试内容，请参照现场接受测试方案

6.3.4. The SAT protocol is provided by Gore.该方案由戈尔提供

6.3.5. For Machine built for SZ installation: The SAT should be conducted by Gore representative(s), and done together with the vendor's technicians. 对于深圳机器：SAT 应由戈尔代表进行，并与供应商的技术人员一起完成

6.3.6. The SAT report should be written by Gore project champion.现场测试报告由戈尔项目负责人书面签收

6.3.7. Any cost arising from supplier's error requiring rework in the field shall be charged back to the supplier.任何由于提供商的失误导致的重工费用需要由提供商承担

6.4. Validation / Testing 验证/测试

6.4.1. Several different geometry parts will be selected for validation 几种不同产品会用于设备的验证。

6.4.2. Capability of camera inspection must greater than 0.9.The capability is classified by means of the parameter "k"(kappa) 相机检验能力指数需要大于 0.9.这个指数以参数 k （kappa）来衡量

6.4.3. Machine has to support manual inspection analysis without malfunction 设备需要支持人工检验分析，不允许有超过规定的设备故障率

6.4.4. Manual inspection analysis failure caused by machine is not acceptable 由于设备造成的人工检验是不可接受的。

6.4.5. Gore will combine the terms of this functional specifications and the output of the first and second design review to create the FAT/SAT protocol document, which will be used as the final version of the machine acceptance standard after checked with the supplier. 戈尔将会综合本功能规格书的条款和第一次、第二次设计评审的输出文件创建 FAT/SAT 验收文件, 在和供应商确认无误后作为最终版本的机器验收标准。

6.5. Technical Support 技术支持

6.5.1. Supplier shall provide ongoing technical support for a period of three months following installation.提供商需要提供安装后的 3 个月内的持续的技术支持

Section 6 Compliance		**Project Acceptance**	**Signature & Date**
		If "No", list exceptions by paragraph number stating reason for exception(s), and if applicable, alternatives. 如果"否"，则用段落号码列出例外并说明理由，如果适用的话，列出备选方案。	
Yes ☐	No ☐		

7. Vendor's Machine Specification 供应商的机器规格

7.1.1. Machine Specification Compliance 机器规格合规

Section 7 Compliance		**Vendor's machine specification**	**Signature & Date**
		If "No", list exceptions by paragraph number stating reason for exception(s), and if applicable, alternatives. 如果"否"，则用段落号码列出例外并说明理由，如果适用的话，列出备选方案。	
Yes ☐	No ☐		

END OF DOCUMENT