

AI 光学视觉检测设备

AI Optical Vision Inspection Equipment

橡胶密封件与精密零部件视觉全检解决方案

Visual full-inspection solution for rubber seals and precision components



目录与选型路径

Catalog & Selection Path

先按检测任务筛选设备，再进入对应系列确认配置边界。

Select equipment by inspection task first, then confirm configuration boundaries by series.

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快速判断 / Quick Selection

正反面外观 + 尺寸

Front/back appearance + size

优先评估 SExpert / MExpert / DExpert 单盘检测结构

Start with SExpert / MExpert / DExpert turntable inspection.

侧面裂纹 + 全周向

Side cracks + 360-degree inspection

优先评估 SCrack360 / DExpert360 360 度检测结构

Start with SCrack360 / DExpert360 360-degree structures.

内部气泡 + 夹杂

Internal bubbles + inclusions

优先评估 X-Ray 成像和安全防护配置

Start with X-Ray imaging and safety shielding.

检测后计数包装

Post-inspection counting & packing

优先评估 AutoBag 视觉计数、入袋和批次统计

Start with AutoBag counting and bagging.

关于力诚

About Licheng

专注机器视觉检测设备研发与交付，为橡塑、汽车、电子、气动等行业客户提供自动化全检方案。

Focused on machine-vision inspection equipment for automated full inspection in rubber, plastics, automotive, electronics and pneumatic parts.



宁波力诚智能机器人有限公司成立于 2011 年，研发团队自 2007 年起从事影像检测技术研发。公司围绕 AI 光学视觉检测、尺寸测量、360 度周向检测、X-Ray 内部缺陷检测和检测后包装联动，提供以样品测试为基础的非标自动化方案。

Founded in 2011, Licheng has worked on image inspection technology since 2007. The company provides sample-test-based custom automation for AI vision, size measurement, 360-degree inspection, X-Ray inspection and packing linkage.

2011

公司成立
Founded

2007

影像检测研发起点
Vision R&D

7

核心设备系列
Core series

样品测试

先验证再定配置
Test before config

检测能力覆盖 / Inspection Coverage

- 表面缺陷、尺寸测量、正反面外观检测
Surface defects, size measurement and front/back appearance
- 360 度周向裂纹、边缘缺口和侧面轮廓检测
360-degree cracks, edge gaps and side profiles
- X-Ray 内部气泡、夹杂、裂纹等不可见缺陷检测
X-Ray for bubbles, inclusions and invisible cracks

非标交付重点 / Custom Delivery Focus

- 按样品、节拍、上料方式和现场空间确认结构
Confirm structure by samples, pace, feeding and site space
- 覆盖相机、光源、运动、剔除、计数和包装联动
Cover cameras, lights, motion, rejection and packing
- 以测试结果和验收标准确定最终配置边界
Use test results to set acceptance boundaries

项目交付流程 / Project Delivery Flow

01 样品确认
Sample

02 成像测试
Imaging

03 方案评估
Solution

04 设备交付
Delivery

05 现场验收
Acceptance

客户沟通建议 / Communication Notes

- 先提交产品照片、尺寸范围、材质和良品/不良品样品，确认缺陷是否能稳定识别。
Provide product photos, size range, material and OK/NG samples to verify stable defect recognition.
- 再结合目标产能、上料方式、剔除方式和是否需要包装联动，确定设备结构。
Confirm equipment structure by capacity, feeding, rejection method and packing linkage requirements.
- 最终配置、速度和检测精度以样品测试结果、现场条件和项目验收标准为准。
Final configuration, speed and accuracy depend on test results, site conditions and acceptance standards.

核心技术优势

Core Technology Advantages

围绕成像、算法、运动控制和非标交付，构建稳定高效的 AI 视觉检测体系。

Combining imaging, algorithms, motion control and custom delivery into a stable AI vision inspection system.

01 AI 图像算法

AI Image Algorithms

结合深度学习与缺陷识别规则，支持毛边、缺口、裂纹、变形、污染等多类缺陷识别，并可基于样本持续优化。

Deep learning and rule-based recognition for burrs, gaps, cracks, deformation and contamination.

02 工业光学成像

Industrial Optical Imaging

组合高分辨率相机、工业镜头和多角度光源，提升边缘、表面和微小缺陷的成像稳定性。

High-resolution cameras, lenses and multi-angle lighting improve edge, surface and micro-defect imaging.

03 实时控制系统

Real-time Control System

将图像采集、算法判断、剔除分选和统计输出放在同一流程中，减少人工抽检的不确定性。

One process handles acquisition, judgment, rejection, sorting and statistics.

04 模块化定制

Modular Customization

按产品尺寸、缺陷位置、节拍目标和现场上下料方式配置相机、光源、工位、分选与包装模块。

Modules align with product size, defect location and target pace.

方案确认逻辑 / Solution Confirmation Logic

阶段 Stage	客户提供 Customer Input	力诚输出 Licheng Output
样品评估 Sample Evaluation	照片、尺寸、材质、缺陷样品 Photos, size, material, defect samples	检测可行性与风险点 Feasibility and risks
方案设计 Solution Design	节拍、上下料、剔除、包装要求 Pace, handling, rejection, packing needs	设备结构、相机光源、工位配置 Structure, cameras, lighting, stations
交付验收 Delivery Acceptance	判定标准、验收样品、现场条件 Criteria, acceptance samples, site conditions	调试报告、培训、后续优化建议 Debug report, training and optimization

产品系列概览

Product Series Overview

以产品尺寸、检测面、节拍和缺陷类型为依据选择设备，当前覆盖 7 个核心设备系列。

Select equipment by product size, inspection surfaces, cycle time and defect type across seven core series.

产品系列 Series	设备类型 Type	适用方向 Application	核心任务 Core Task
SExpert	小号单盘检测设备 Small single-table inspection	O 型圈、密封圈、小尺寸橡胶件 O-rings, seals and small rubber parts	小尺寸 O 型圈、密封圈外观与尺寸全检 Appearance and size checks for small seals
SCrack360	挤压 360 检测设备 Compression 360 inspection	O 型圈、环形密封件、弹性橡胶件 O-rings, ring seals and elastic rubber parts	环形件 360 度裂纹、变形和表面异常检测 360-degree crack and deformation checks
MExpert	中号单盘检测设备 Medium single-table inspection	中等尺寸 O 型圈、密封件、橡胶零件 Medium O-rings, seals and rubber parts	中等尺寸密封件尺寸测量、缺陷检测与分选 Size, defect and sorting checks for medium seals
DExpert	大号单盘检测设备 Large single-table inspection	大尺寸 O 型圈、异形密封件、橡胶垫片 Large O-rings, irregular seals and rubber gaskets	大尺寸橡胶件、异形密封件外观与尺寸控制 Appearance and size control for large parts
DExpert360	大号 360 检测设备 Large 360 inspection	大尺寸环形件、密封件、异形橡胶件 Large ring parts, seals and irregular rubber parts	大尺寸环形件全周向检测与多相机扩展 360-degree inspection with multi-camera expansion
AutoBag	视觉计数包装机 Counting packing machine	橡胶、塑料、PTFE、金属等零件 Rubber, plastic, PTFE and metal parts	视觉计数、分选、入袋包装和批次管理 Counting, sorting, bagging and batch management
X-Ray	视觉检测设备 Vision inspection system	橡胶、塑料、PTFE、金属等零件 Rubber, plastic, PTFE and metal parts	内部结构、夹杂、气泡、裂纹等问题检测 Internal structure, inclusions, bubbles and cracks

选型矩阵 / Selection Matrix

需求 Need	推荐方向 Recommended Series	需确认的关键资料 Key Data to Confirm
正反面外观、尺寸、同心度 Front/back appearance, size, concentricity	SExpert / MExpert / DExpert	尺寸范围、缺陷样品、节拍、上料方式 Size range, defect samples, pace, feeding method
侧边裂纹、全周向缺陷 Side cracks, circumferential defects	SCrack360 / DExpert360	直径、硬度、侧面缺陷样品、夹持限制 Diameter, hardness, side defect samples, clamping limits
内部气泡、夹杂、内部裂纹 Internal bubbles, inclusions, cracks	X-Ray	材料密度、厚度、内部缺陷样品、安全要求 Material density, thickness, internal samples, safety needs
计数、分选、入袋包装 Counting, sorting and bagging	AutoBag	单包数量、包装规格、是否联动前道检测 Bag quantity, packaging spec, upstream linkage

选型资料准备 / Selection Data Checklist

产品资料

Product Data

- 尺寸范围、材质、重量
Size range, material, weight
- 产品照片或三维/二维图纸
Photos or 3D/2D drawings

缺陷样品

Defect Samples

- 良品与不良品对照
OK/NG comparison
- 缺陷位置、大小和判定边界
Location, size and judgment

现场条件

Site Conditions

- 目标节拍、上料方式
Target pace and feeding method
- 剔除、包装和联动要求
Rejection, packing and linkage needs

小号单盘检测设备
Small single-table inspection

SExpert

面向小尺寸 O 型圈、橡胶密封件的外观、尺寸与表面缺陷检测。

For appearance, size and surface defect inspection of small O-rings and rubber seals.



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检测项目 / Inspection Items

变形 Deformation	断裂 Breakage	堵塞 Blockage	内径 / 外径 ID / OD
毛边 Burr	缺口 Chipping	同心度 Concentricity	表面缺陷 Surface defect

适合场景 / Suitable Applications

- 小尺寸 O 型圈、密封圈、垫片
Small O-rings, seals and gaskets
- 多规格批量全检
Batch inspection for multiple specifications
- 正反面外观、尺寸和同心度并行检测
Front/back appearance, size and concentricity

配置边界 / Configuration Boundary

- 侧面/全周裂纹优先评估 360 结构
Use 360 structure first for side or circumferential cracks
- 最终节拍按样品、上料和剔除方式确认
Final pace depends on samples, feeding and rejection

技术规格 / Technical Specifications

参数 Parameter	说明 Description
适用产品 Applicable Products	O 型圈、密封圈、小尺寸橡胶件 O-rings, seals and small rubber parts
检测方式 Inspection Method	单盘上料，多相机视觉检测 Single-turntable feeding with multi-camera vision
检测内容 Inspection Scope	外观缺陷、尺寸、同心度、表面异常 Appearance defects, size, concentricity and surface anomalies
方案确认 Solution Confirmation	以样品测试和节拍要求为准 Subject to sample testing and cycle-time requirements

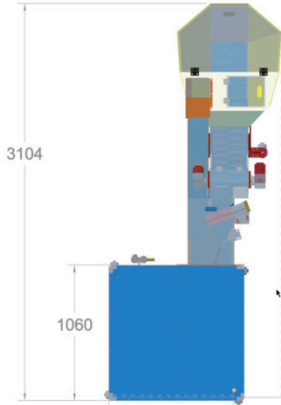
SExpert 布局与样品

SExpert Layout & Samples

补充真实设备布局、结构示意图和缺陷样品图，用于辅助选型沟通。

Adds real equipment layouts, structural views and defect sample images for selection discussions.

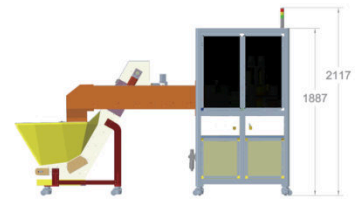
设备布局 / 结构示意图 / Equipment Layout / Structure



俯视图 / Top View



正视图 / Front View



侧视图 / Side View

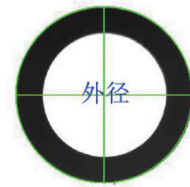
产品缺陷 / 检测样品 / Product Defects / Sample Images



缺陷样品
Defect Sample



断裂
Breakage



外径
Outer Diameter



变形
Deformation



堵塞
Blockage



毛边
Burr

挤压 360 检测设备

Compression 360 inspection

SCrack360

用于环形件 360 度裂纹、变形和表面异常检测。

For 360-degree crack, deformation and surface abnormality inspection of ring parts.


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检测项目 / Inspection Items

360 度裂纹 360 crack	变形 Deformation	表面异常 Surface abnormality	边缘缺陷 Edge defect
毛边 Burr	缺口 Chipping	尺寸偏差 Size deviation	

适合场景 / Suitable Applications

- 侧面裂纹、边缘缺口、周向变形
Side cracks, edge gaps and circumferential deformation
- 普通平面相机难覆盖的环形件
Ring parts difficult for flat cameras
- 需要全周向观察的弹性橡胶件
Elastic rubber parts requiring full-circumference view

配置边界 / Configuration Boundary

- 硬度、直径和表面状态会影响挤压展开
Hardness, diameter and surface affect compression spreading
- 非环形或不可挤压产品需重新评估结构
Non-ring or non-compressible parts need reevaluation

技术规格 / Technical Specifications

参数 Parameter	说明 Description
适用产品 Applicable Products	O 型圈、环形密封件、弹性橡胶件 O-rings, ring seals and elastic rubber parts
检测方式 Inspection Method	挤压展开 / 周向视觉检测 Compression spreading / circumferential vision
检测内容 Inspection Scope	裂纹、变形、侧边缺陷、表面异常 Cracks, deformation, side defects and surface anomalies
方案确认 Solution Confirmation	以产品尺寸、材质和缺陷样本为准 Subject to product size, material and defect samples

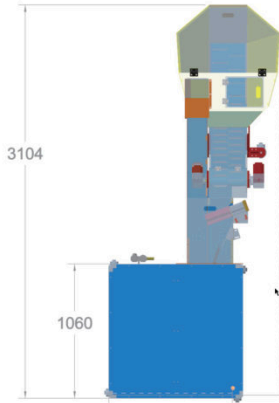
SCrack360 布局与样品

SCrack360 Layout & Samples

补充真实设备布局、结构示意图和缺陷样品图，用于辅助选型沟通。

Adds real equipment layouts, structural views and defect sample images for selection discussions.

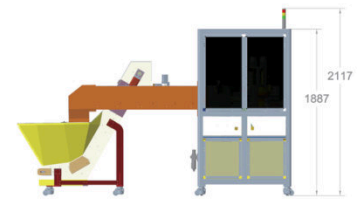
设备布局 / 结构示意图 / Equipment Layout / Structure



俯视图 / Top View

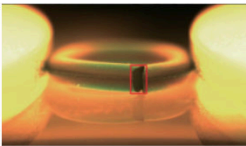


正视图 / Front View

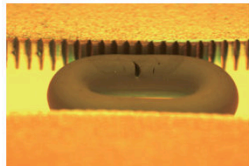


侧视图 / Side View

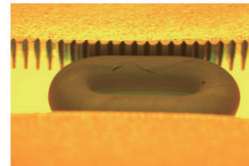
产品缺陷 / 检测样品 / Product Defects / Sample Images



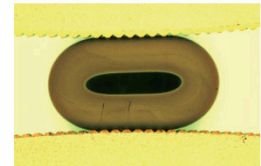
开裂样品
Crack Sample



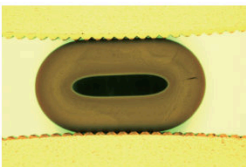
侧边裂纹 1
Side Crack 1



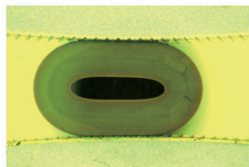
侧边裂纹 2
Side Crack 2



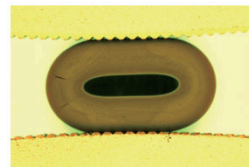
侧面外观 1
Side Appearance 1



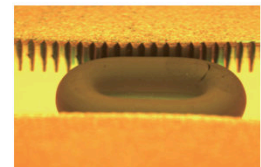
侧面外观 2
Side Appearance 2



侧面外观 3
Side Appearance 3



侧面外观 4
Side Appearance 4



侧边裂纹 3
Side Crack 3

中号单盘检测设备
Medium single-table inspection



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MExpert

面向中等尺寸密封件，兼顾尺寸测量、缺陷检测和稳定分选节拍。

For medium-size seals, combining size measurement, defect inspection and stable sorting pace.



检测项目 / Inspection Items

外观缺陷 Appearance defect	内径 / 外径 ID / OD	厚度 Thickness	同心度 Concentricity
毛边 Burr	缺口 Chipping	污染 Contamination	表面划伤 Surface scratch

适合场景 / Suitable Applications

- 中等尺寸 O 型圈、异形圈、密封件
Medium O-rings, special rings and seals
- 尺寸测量与缺陷识别并行
Size measurement with defect recognition
- 橡塑、汽车、气动零部件批量检测
Batch inspection for rubber, auto and pneumatic parts

配置边界 / Configuration Boundary

- 大尺寸或重量较高产品优先评估 DExpert
Large or heavy parts should start with DExpert
- 复杂侧面缺陷需结合 360 方案
Complex side defects may need a 360 solution

技术规格 / Technical Specifications

参数 Parameter	说明 Description
适用产品 Applicable Products	中等尺寸 O 型圈、密封件、橡胶零件 Medium O-rings, seals and rubber parts
检测方式 Inspection Method	单盘上料，多工位视觉检测 Single-turnstile feeding with multi-station vision
检测内容 Inspection Scope	尺寸、厚度、外观、边缘和表面缺陷 Size, thickness, appearance, edge and surface defects
方案确认 Solution Confirmation	以样品测试结果确认最终配置 Final configuration confirmed by sample test results

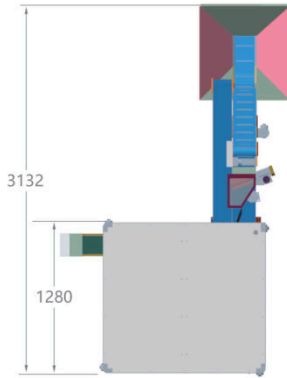
MExpert 布局与样品

MExpert Layout & Samples

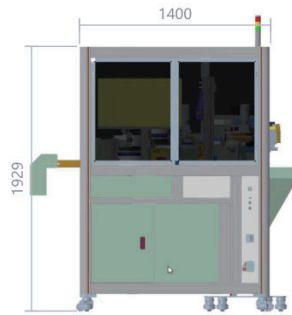
补充真实设备布局、结构示意图和缺陷样品图，用于辅助选型沟通。

Adds real equipment layouts, structural views and defect sample images for selection discussions.

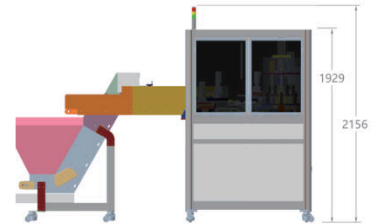
设备布局 / 结构示意图 / Equipment Layout / Structure



俯视图 / Top View

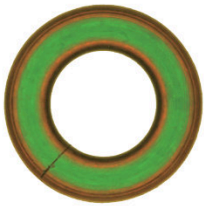


正视图 / Front View



侧视图 / Side View

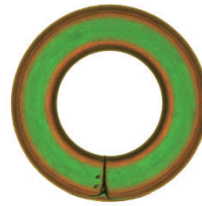
产品缺陷 / 检测样品 / Product Defects / Sample Images



表面缺陷定位
Surface Defect Positioning



边缘缺陷定位
Edge Defect Positioning



检测样品对照
Sample Comparison



断裂
Breakage



外径
Outer Diameter



变形
Deformation



堵塞
Blockage



毛边
Burr

大号单盘检测设备
Large single-table inspection



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DExpert

适合大尺寸橡胶件、异形密封件的外观检测和尺寸控制。

For appearance inspection and size control of large rubber parts and irregular seals.



检测项目 / Inspection Items

大尺寸外观 Large-part appearance	尺寸测量 Size measurement	边缘缺陷 Edge defect	毛边 Burr
缺口 Chipping	污染 Contamination	变形 Deformation	表面异常 Surface abnormality

适合场景 / Suitable Applications

- 大尺寸 O 型圈、异形密封件、橡胶垫片
Large O-rings, irregular seals and rubber gaskets
- 上料空间和成像范围要求更高的产品
Products needing larger feeding and imaging range
- 边缘和关键区域专用检测
Dedicated inspection of edges and key areas

配置边界 / Configuration Boundary

- 全周向侧面缺陷优先评估 DExpert360
Use DExpert360 first for circumferential side defects
- 设备尺寸、台面和上料需按产品重量确认
Size, table and feeding depend on product weight

技术规格 / Technical Specifications

参数 Parameter	说明 Description
适用产品 Applicable Products	大尺寸 O 型圈、异形密封件、橡胶垫片 Large O-rings, irregular seals and rubber gaskets
检测方式 Inspection Method	单盘检测，可扩展多工位 Single-turntable inspection, expandable to multiple stations
检测内容 Inspection Scope	外观、尺寸、边缘、表面缺陷 Appearance, size, edge and surface defects
方案确认 Solution Confirmation	根据产品尺寸、重量和节拍定制 Customized by size, weight and cycle time

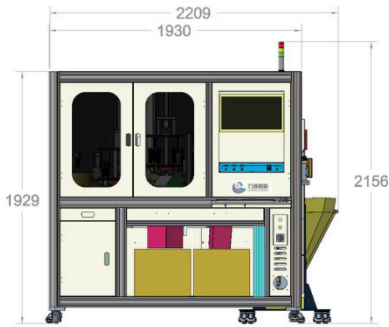
DExpert 布局与样品

DExpert Layout & Samples

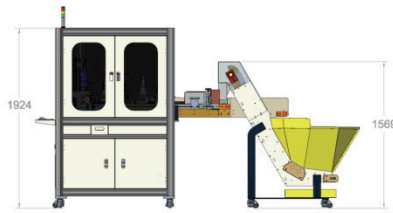
补充真实设备布局、结构示意图和缺陷样品图，用于辅助选型沟通。

Adds real equipment layouts, structural views and defect sample images for selection discussions.

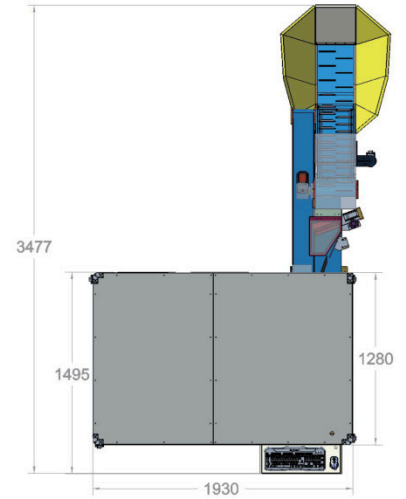
设备布局 / 结构示意图 / Equipment Layout / Structure



正视图 / Front View

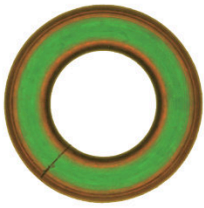


侧视图 / Side View



俯视图 / Top View

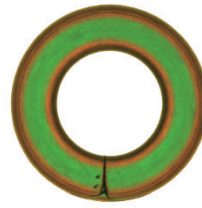
产品缺陷 / 检测样品 / Product Defects / Sample Images



表面缺陷定位
Surface Defect Positioning



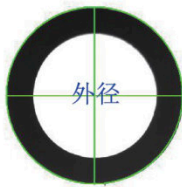
边缘缺陷定位
Edge Defect Positioning



检测样品对照
Sample Comparison



断裂
Breakage



外径
Outer Diameter



变形
Deformation



堵塞
Blockage



毛边
Burr

大号 360 检测设备

Large 360 inspection


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DExpert360

针对大尺寸产品全周向视觉检测，可扩展多相机、多工位检测结构。

For 360-degree visual inspection of large products, expandable to multi-camera and multi-station structures.


检测项目 / Inspection Items

360 度裂纹 360 crack	侧边缺陷 Side defect	变形 Deformation	毛边 Burr
缺口 Chipping	尺寸偏差 Size deviation	表面异常 Surface abnormality	

适合场景 / Suitable Applications

- 大尺寸环形件全周向检测
360-degree inspection of large ring parts
- 侧边裂纹、周向变形、边缘缺陷
Side cracks, deformation and edge defects
- 需要多相机、多工位组合的场景
Multi-camera and multi-station scenarios

配置边界 / Configuration Boundary

- 产品硬度和表面反光会影响成像
Hardness and surface reflection affect imaging
- 节拍、夹持和输送方案需按样品验证
Pace, clamping and transfer require sample validation

技术规格 / Technical Specifications

参数 Parameter	说明 Description
适用产品 Applicable Products	大尺寸环形件、密封件、异形橡胶件 Large ring parts, seals and irregular rubber parts
检测方式 Inspection Method	360 度周向视觉检测 360-degree circumferential vision inspection
检测内容 Inspection Scope	裂纹、侧边缺陷、变形、表面异常
方案确认 Solution Confirmation	以尺寸、硬度、缺陷样本和节拍为准 Subject to size, hardness, defect samples and cycle time

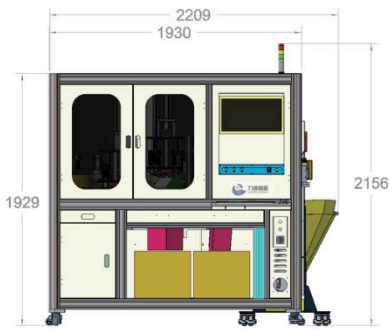
DExpert360 布局与样品

DExpert360 Layout & Samples

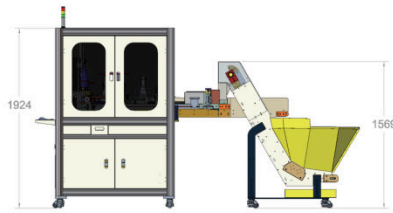
补充真实设备布局、结构示意图和缺陷样品图，用于辅助选型沟通。

Adds real equipment layouts, structural views and defect sample images for selection discussions.

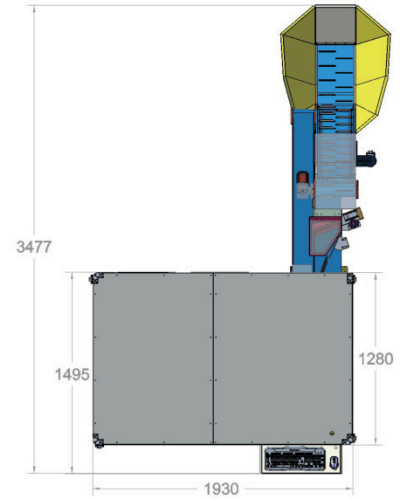
设备布局 / 结构示意图 / Equipment Layout / Structure



正视图 / Front View

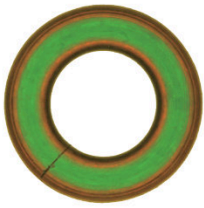


侧视图 / Side View



俯视图 / Top View

产品缺陷 / 检测样品 / Product Defects / Sample Images



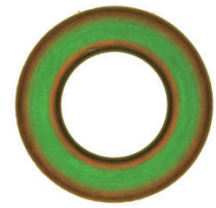
上表面样品
Upper Surface Sample



下表面样品
Lower Surface Sample



周向缺陷样品
Circumferential Defect Sample



边缘缺陷样品
Edge Defect Sample



侧面轮廓 1
Side Profile 1



侧面轮廓 2
Side Profile 2



侧面缺陷 1
Side Defect 1



侧面缺陷 2
Side Defect 2

视觉计数包装机

Counting packing machine

AutoBag

视觉计数、分选与包装联动，适合检测后自动化入袋和批量管理。

Visual counting, sorting and packing linkage for automated bagging and batch management after inspection.


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检测项目 / Inspection Items

缺口 Chipping	内径 / 外径 ID / OD	变形 Deformation	断裂 Breakage
毛边 Burr	真圆度 Roundness	同心度 Concentricity	计数包装 Counting & packing

适合场景 / Suitable Applications

- 检测后计数、分选、入袋
Counting, sorting and bagging after inspection
- 橡胶、塑料、PTFE、金属等小零件
Small rubber, plastic, PTFE and metal parts
- 需要减少人工计数误差的批量包装
Batch packing with less manual counting error

配置边界 / Configuration Boundary

- 卡料、粘连和换型频率会影响方案
Jamming, adhesion and changeover frequency affect the
- 是否接前道检测决定最终联动结构
Final linkage depends on upstream inspection connection

技术规格 / Technical Specifications

参数 Parameter	说明 Description
适用产品 Applicable Products	橡胶、塑料、PTFE、金属等零件 Rubber, plastic, PTFE and metal parts
参考尺寸 Reference Size	最小约 6mm，可按样品定制；最大约 50mm Min. approx. 6mm, sample-customized; max. approx. 50mm
参考厚度 Reference Thickness	约 1-10mm Approx. 1-10mm
检测速度 Inspection Speed	最高约 48000 件/小时，取决于尺寸和材质 Up to approx. 48,000 pcs/hour, depending on size and material

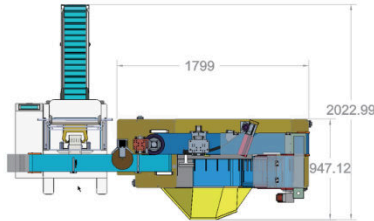
AutoBag 布局与样品

AutoBag Layout & Samples

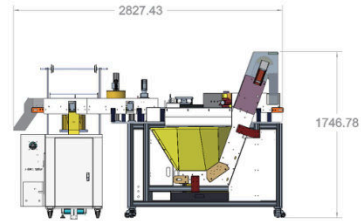
补充真实设备布局、结构示意图和缺陷样品图，用于辅助选型沟通。

Adds real equipment layouts, structural views and defect sample images for selection discussions.

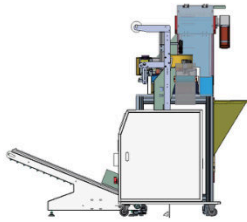
设备布局 / 结构示意图 / Equipment Layout / Structure



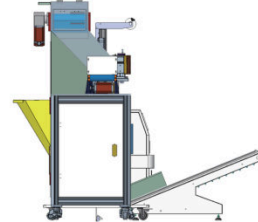
俯视图 / Top View



正视图 / Front View



左侧视图 / Left Side View



右侧视图 / Right Side View

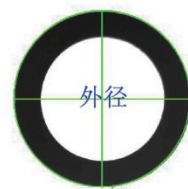
产品缺陷 / 检测样品 / Product Defects / Sample Images



缺陷样品
Defect Sample



断裂
Breakage



外径
Outer Diameter



变形
Deformation



堵塞
Blockage



毛边
Burr

视觉检测设备

Vision inspection system

X-Ray

用于检测产品内部结构、夹杂、气泡、裂纹等常规光学难以覆盖的问题。

For internal structure, inclusion, bubble and crack issues that conventional optical vision cannot cover.


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检测项目 / Inspection Items
内部结构
Internal structure

夹杂
Inclusion

气泡
Bubble

内部裂纹
Internal crack

厚度异常
Thickness abnormality

尺寸异常
Size abnormality

适合场景 / Suitable Applications

- 内部夹杂、气泡、内部裂纹
Internal inclusions, bubbles and cracks
- 常规光学视觉无法观察的内部结构
Internal structures invisible to optical vision
- 高可靠性产品的补充检测
Supplemental inspection for high-reliability products

配置边界 / Configuration Boundary

- 材料密度、厚度和目标节拍决定 X-Ray 配置
Material density, thickness and target pace decide X-Ray
- 需按法规和现场要求确认安全防护
Safety shielding follows regulations and site requirements

技术规格 / Technical Specifications

参数 Parameter	说明 Description
适用产品 Applicable Products	橡胶、塑料、PTFE、金属等零件 Rubber, plastic, PTFE and metal parts
参考尺寸 Reference Size	最小约 30mm, 可按样品定制; 最大约 75mm Min. approx. 30mm, sample-customized; max. approx. 75mm
参考厚度 Reference Thickness	最大约 50mm Max. approx. 50mm
检测速度 Inspection Speed	最高约 3000 件/小时, 取决于尺寸和材质 Up to approx. 3,000 pcs/hour, depending on size and material

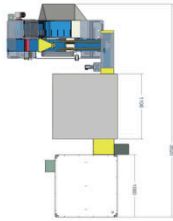
X-Ray 布局与样品

X-Ray Layout & Samples

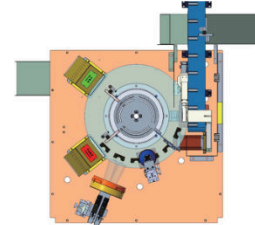
补充真实设备布局、结构示意图和缺陷样品图，用于辅助选型沟通。

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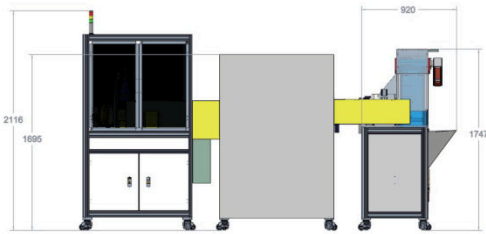
设备布局 / 结构示意图 / Equipment Layout / Structure



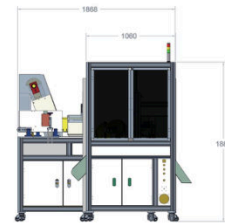
整体俯视图 / Overall Top View



检测工位俯视图 / Inspection Station Top View

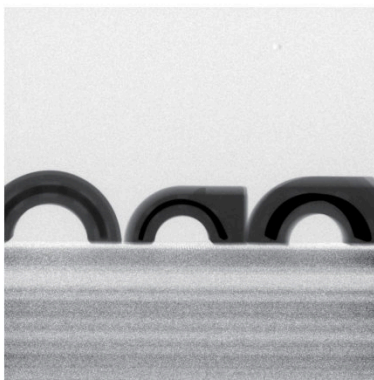


正视图 / Front View

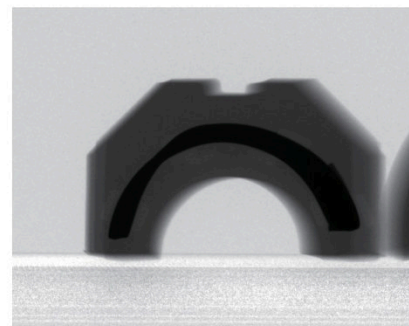


侧视图 / Side View

产品缺陷 / 检测样品 / Product Defects / Sample Images



内部成像 1
Internal Image 1



内部成像 2
Internal Image 2

模块化配置

Modular Configuration

围绕检测面、尺寸、厚度、周向缺陷和包装联动，按样品与产线要求组合模块。

Combine modules by inspection surfaces, size, thickness, circumferential defects and packing linkage.

高度相机

Height Camera

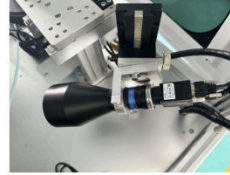


用于厚度、高度或变形相关检测，按产品形态确认成像方式。

For thickness, height or deformation checks; imaging is confirmed by product shape.

A/B 面相机

A/B-side Cameras



支持正反面外观检测，通过多相机组合提高覆盖范围。

Front/back inspection with multi-camera coverage.

360 度工作台

360-degree Worktable



用于侧边、合模线和全周向缺陷检测，可按产品尺寸扩展。

For side, parting-line and circumferential defect inspection; scalable by product size.

尺寸相机

Size Camera

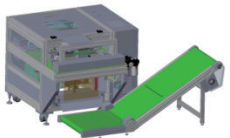


用于内外径、线径、同心度等尺寸控制，最终精度以样品测试为准。

For ID/OD, wire diameter and concentricity control; final accuracy depends on sample testing.

包装联动

Packing Linkage

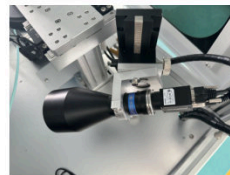


检测后可接计数、分选和入袋包装，减少人工计数误差。

Connects counting, sorting and bagging after inspection to reduce manual counting errors.

自动调节

Auto Adjustment



适合多规格切换场景，降低换型时间和人工调整成本。

Suitable for multi-spec changeovers, reducing setup time and manual adjustment cost.

配置原则 / Configuration Principle

先确认产品尺寸、材质、缺陷位置和节拍，再确定相机数量、光源角度、工位结构、剔除方式和是否接入包装联动。

Confirm product size, material, defect location and target pace first, then decide camera count, lighting angle, station structure, rejection method and packing linkage.

核心参数对照

Key Parameters

以下为常用配置参考，最终配置、速度和检测精度以样品测试及项目方案为准。

The following are common configuration references; final configuration, speed and accuracy depend on sample testing and project proposal.

标准视觉检测

Standard Vision Inspection

正反面外观、尺寸与常规缺陷检测，按产品尺寸和上料空间选择设备结构。

For front/back appearance, size and common defects; select the structure by product size and feeding

系列 Series	结构 / 相机 Structure / Camera	产品范围 Product Range	参考速度 Ref. Speed	外形尺寸 Dimensions
SExpert	单盘 / 600mm / 1-4 个相机 Single / 600mm / 1-4 cams	外径 OD: 6-50mm 厚度 THK: 1-10mm	约 600 件/分钟 Approx. 600 pcs/min	1060×1060×1889
MExpert	单盘 / 800mm / 标配 3 个相机 Single / 800mm / Std. 3 cams	外径 OD: 6-50mm / 10-80mm 厚度 THK: 1-6mm	约 600 件/分钟 Approx. 600 pcs/min	1400×1280×1929
DExpert	双 800mm 转盘 / 3-4 个相机 Dual 800mm tables / 3-4 cams	外径 OD: 6-50mm / 10-80mm 厚度 THK: 1-6mm	约 600 件/分钟 Approx. 600 pcs/min	1930×1280×1929

360 度周向检测

360-degree Circumferential Inspection

面向侧边裂纹、周向变形、边缘缺陷等普通平面相机难覆盖的位置。

For side cracks, circumferential deformation and edge defects that flat cameras are difficult to cover.

系列 Series	结构 / 相机 Structure / Camera	产品范围 Product Range	参考速度 Ref. Speed	外形尺寸 Dimensions
SCrack360	挤压 360 / 600mm / 1-5 个相机 360 press / 600mm / 1-5 cams	外径 OD: 6-50mm 厚度 THK: 1-10mm	约 120 件/分钟 Approx. 120 pcs/min	1060×1060×1889
DExpert360	大号 360 结构 / 9-28 个相机 Large 360 / 9-28 cams	外径 OD: 6-50mm / 10-80mm 厚度 THK: 1-6mm	约 600 件/分钟 Approx. 600 pcs/min	1930×1280×1929

包装与内部检测

Packing & Internal Inspection

用于检测后计数入袋、分选联动，或气泡、夹杂、内部裂纹等内部质量问题。

For counting and bagging after inspection, sorting linkage, or internal bubbles, inclusions and cracks.

系列 Series	结构 / 相机 Structure / Camera	产品范围 Product Range	参考速度 Ref. Speed	外形尺寸 Dimensions
AutoBag	计数包装线 / 按方案配置 Packing line / By solution	外径 OD: 6-50mm 厚度 THK: 1-10mm	约 800 件/分钟 Approx. 800 pcs/min	2827×2019×1747
X-Ray	X 光成像 / 按方案配置 X-ray imaging / By solution	外径 OD: 30-75mm 厚度 THK: ≤50mm	约 3000 件/小时 Approx. 3,000 pcs/hour	3620×1870×2110

精度与检测边界 / Accuracy & Inspection Boundaries

尺寸精度

Size Accuracy

30/50/80mm 典型范围参考: ± 0.02 / ± 0.03 / ± 0.05 mm.
Typical 30/50/80mm reference ranges: ± 0.02 / ± 0.03 / ± 0.05 mm.

速度说明

Speed Notes

受尺寸、材质、上料、缺陷、相机和剔除方式影响。
Depends on size, material, feeding, cameras and reject method.

样品验证

Sample Validation

异形、透明、反光、粘连或侧面缺陷产品，需先做样品测试。
Irregular, transparent, reflective, sticky or side-defect products should be sample-tested first.

产线适配

Line Integration

接入前后道、包装、统计或追溯系统时，方案阶段确认接口。
Confirm interfaces for line, packing, statistics and traceability.

非标定制与检测流程

Custom Configuration & Inspection Workflow

面向橡胶、硅胶、塑料、金属等多类零件，按缺陷位置和生产节拍定制检测方案。

Custom inspection solutions for rubber, silicone, plastic and metal parts by defect location and production pace.

项目流程 / Project Workflow



非标定制方向

Custom Design Directions

- 按产品尺寸、形状、颜色和材质定制上料与工装
Customize feeding and fixtures by size, shape and
- 按缺陷位置配置正反面、侧面、周向或内部检测
Select front/back, side, 360 or internal inspection.
- 可接入剔除、分选、计数、包装和统计追溯
Link rejection, sorting, counting, packing and traceability.

X-Ray 内部检测价值

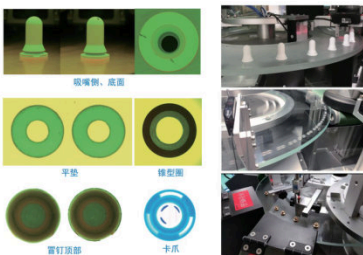
Value of X-Ray Internal Inspection

- 无需破坏产品即可观察内部结构
Observe internal structure without damage.
- 用于气泡、夹杂、骨架偏移、密度差异等问题
Detect bubbles, inclusions, insert shift and density
- 检测结果可记录，用于质量追溯和工艺优化
Record results for traceability and process optimization.

多材质检测样品 / Multi-material Inspection Samples



定制检测效果 / Custom Inspection Result



多材质检测样品 / Multi-material Inspection Samples

橡胶硅胶件 / Rubber / Silicone Parts

金属 / 塑料件 / Metal / Plastic Parts

应用案例

Applications

以下场景用于说明常见项目的评估逻辑，实际配置仍需结合样品、缺陷标准、节拍和现场上下料方式确认。

The following scenarios show typical evaluation logic; final configuration depends on samples, defect standards, cycle time and handling conditions.

01 小尺寸 O 型圈外观与尺寸全检

Appearance and size inspection for small O-rings

推荐设备: SExpert

Recommended: SExpert

正反面外观、尺寸、毛边、缺口、堵塞和同心度检测，适合多规格小尺寸密封件。

Front/back appearance, size, burrs, gaps, blockage and concentricity for multi-spec small seals.

02 环形件侧边裂纹与全周向检测

Side cracks and circumferential inspection for ring parts

推荐设备: SCrack360 / DExpert360

Recommended: SCrack360 / DExpert360

当缺陷位于侧面、外周或平面相机难覆盖的位置时，优先评估 360 度结构。

For side or outer-circumference defects, use a 360-degree structure.

03 检测后视觉计数与自动入袋

Visual counting and automatic bagging after inspection

推荐设备: AutoBag

Recommended: AutoBag

检测后需要计数、分选、入袋和批量管理的产品，可减少人工计数误差。

For counting, sorting, bagging and batch management after inspection.

04 内部气泡、夹杂和裂纹检测

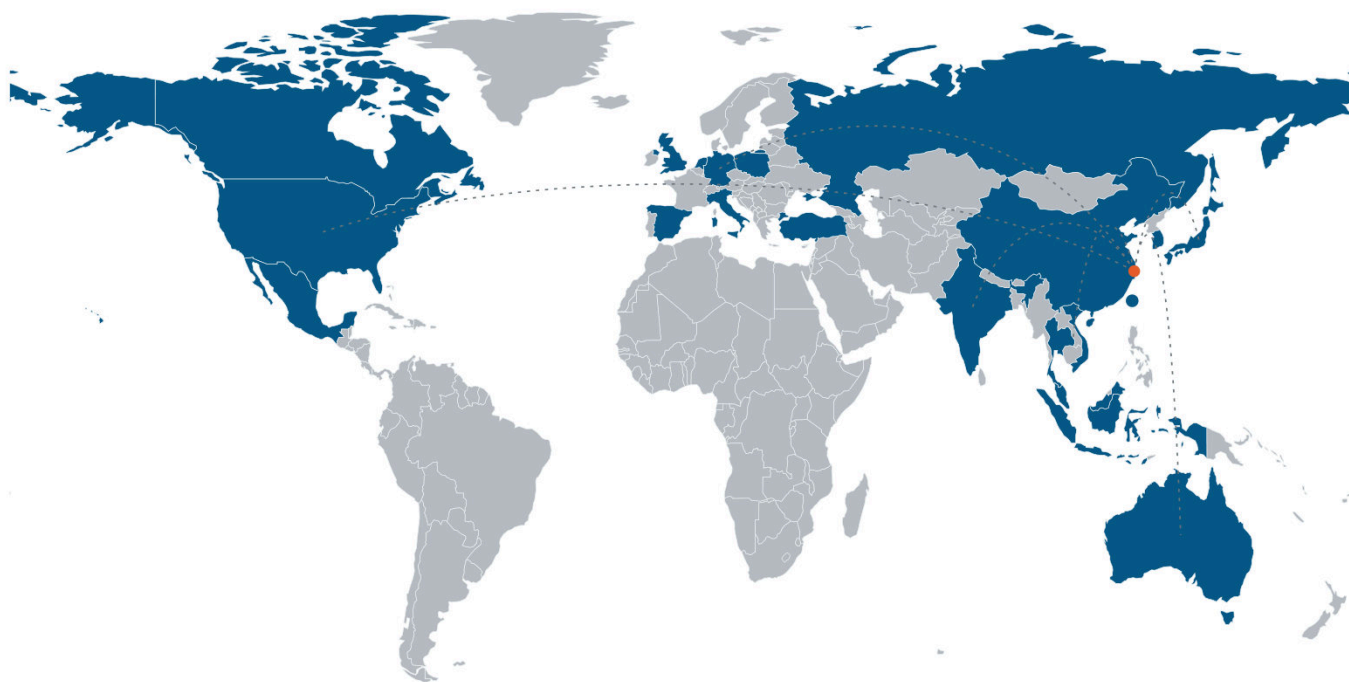
Internal bubble, inclusion and crack inspection

推荐设备: X-Ray

Recommended: X-Ray

常规光学视觉无法观察内部结构时，可评估 X-Ray 成像方案作为补充检测。

Use X-Ray when optical vision cannot inspect internal structures.



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