Project xx

**BILL OF QUANTITIES – LASER PROTECTION DOORS**

POS. DESCRIPTION QUANTITY UNIT UNIT PRICE TOTAL PRICE

**01.01 LASER PROTECTION DOORS**

**01.01.0010 HIGH-SPEED SPIRAL DOOR**

Reference product**: EFAFLEX type “EFA-SST®-L LAS”**Dimensions of manufacture**: 0.000 x 0.000 mm**

Manufacture, delivery, and installation of:

A **High-Speed Spiral Door type “EFA-SST®-LAS”** in **laser-proof design**, equipped with an electromechanical high-performance door drive, intended as a **room-enclosing protective device against laser radiation**.  
  
The door system essentially consists of:  
• Self-supporting steel side frames  
• All steel components galvanized as standard  
• Spiral-guided door blade system  
  
**Force transmission** is implemented on both sides:  
For this purpose, a **synchronised drive shaft** is installed. For precise, smooth, and low-noise guidance of the hinge-belt system, **precision roller assemblies with ball bearings** must be used.  
An adequately dimensioned **tension spring mechanism**, installed inside the side frames, ensures the **counterbalancing of the door blade** in accordance with **DIN EN 12604**, allowing **manual opening** of the door (e.g. during power failure).  
  
The **door blade** consists of **double-walled aluminium laths**, fixed within hinge belts and guided vertically (upwards/downwards).  
The overlapping lath joints prevent direct penetration of laser radiation.  
The aluminium laths are finished in **anodized surface E6/EV1**.  
  
The **SPIRAL HOUSING** is engineered so that the laths of the door blade run **completely contact-free**, ensuring **wear-free and low-noise operation**.  
  
The **DOOR DRIVE** is a geared brake motor designed as a **high-frequency drive unit**.  
Door positions are continuously monitored via **wear-free inductive proximity sensors**, with end positions determined electronically.  
  
The **MICROPROCESSOR CONTROL UNIT**, including the frequency inverter, is mounted in a **separate control cabinet, protection class IP 65**.  
Connection to 230 V, 50 Hz by customer.

The delivery includes the **EFA Safety Light Grille (EFA-TLG®)**, TÜV-certified and active precisely within the closing plane:  
This integrated safety system, fully protected inside the side frames, generates an exceptionally dense infrared light grid up to a height of **2.5 m**.  
Obstacles are detected without contact, immediately stopping the automatic closing movement.  
  
  
During design, production, and installation of the door, the following standards and regulations are observed, in particular:  
**DIN EN 13241-1, DIN EN 60825-4, VDE 0837 Part 4**  
  
  
**OPENING SPEED: approx. 1.0 m/s  
MAX. DOOR BLADE SPEED: up to approx. 1.5 m/s (depending on door size)  
CLOSING SPEED: approx. 0.5 m/s**

Power connection on site: **230 V / 50–60 Hz**, fuse protection **16 A**  
Including functional testing and commissioning for clear opening:

Width = ............... mm × Height = ............... mm  
  
  
**Offered product:**  
EFAFLEX type **“EFA-SST®-L LAS”**  
(Bidder specification) **1,000 pieces ………………… …………………**

**01.01.0010 Spiral cover – lower and front section**

Sheet steel, galvanized, powder-coated or stainless steel (V2A)  
(Required when installed on the cold side)

**1,000 pieces ………………… …………………**

**01.01.0020 Upper spiral cover as dust protection**

Sheet steel, galvanized, powder-coated or stainless steel (V2A)  
(Not available when installed on the cold side)

**1,000 pieces ………………… …………………**

**01.01.0030 Powder coating**

Powder coating of all visible steel components according to RAL  
(except pearl and luminous colours)

**1,000 pieces ………………… …………………**

**01.01.0040 Stainless steel design**

All visible sheet metal components in stainless steel (V2A),  
including stainless-steel bearings for deflection and guide rollers.  
(Small parts inside the frame are not stainless steel)

**1,000 pieces ………………… …………………**

**01.01.0050 Push-button controls**

Various versions:  
• Surface-mounted push button (OPEN)  
• DT2, OPEN/CLOSE, surface-mounted  
• DT-EX, OPEN/STOP/CLOSE, surface-mounted

**1,000 pieces ………………… …………………**

**01.01.0060 Pull switch**

**1,000 pieces ………………… …………………**

**01.01.0070 Safety limit switch (Cat. IV)**

Type Euchner CES-AZ-AES-01B  
Signal: “Door closed”

**1,000 pieces ………………… …………………**

**01.01.0080 Impact protection bollards:**

Type FLEXCORE 6, consisting of:  
Robust steel core, rotatable HDPE outer shell, and shock-absorbing elastic ring  
Height: 1,370 mm  
Diameter: 182 mm

**1,000 pieces ………………… …………………**

* 1. **LASER PROTECTION DOORS Total: …………………**