National Institute of Standards and Technology

Trial Description

- **Task**: Build **2** shipments from 2 orders. The initial order is interrupted at a convenient time by a second order, which is of higher priority (hpo). The robot must complete hpo as fast as possible and then must resume the completion of the initial order.
  - The conveyor belt is used.
  - There are faulty products in the environment.
  - 1 pulley must be flipped in AGV1.
  - The gripper is faulty and drops products over both AGVs.

- **Orders**: 2 orders. order_0 consists of 1 single shipment (order_0::shipment_0). order_1 consists of 1 single shipment (order_1::shipment_0).
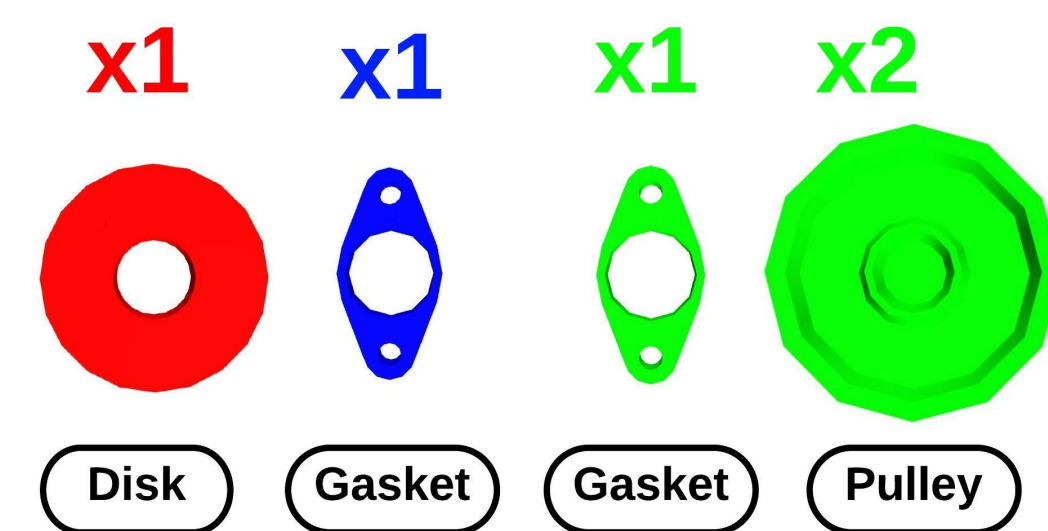 - The shipment in order_0 consists of 5 products in total:

Fig. 1: Products used in shipment for order_0.

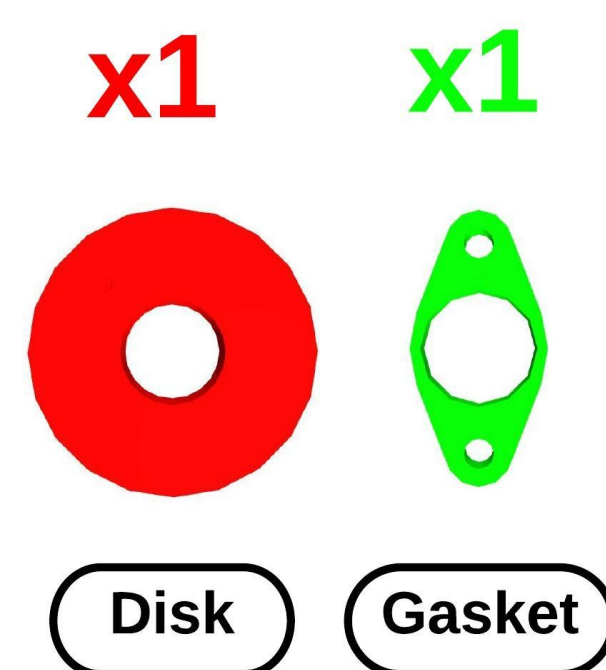 - The shipment in order_1 consists of 2 products in total:

Fig. 2: Products used in shipment for order_1.

- **Maximum completion score**: 28 pts.
- **Agility challenges**:
  - Faulty products.
  - Flipped products.
  - Faulty grippers.
  - Sensor blackout: All sensors will stop working temporarily.
- **Product vessels**: bin × 1, shelf × 2, conveyor belt is used and is the only source for green pulleys (10 in total).

- **Shipment deliveries**:
  - order_0::shipment_0: AGV1.
  - order_1::shipment_0: AGV2.
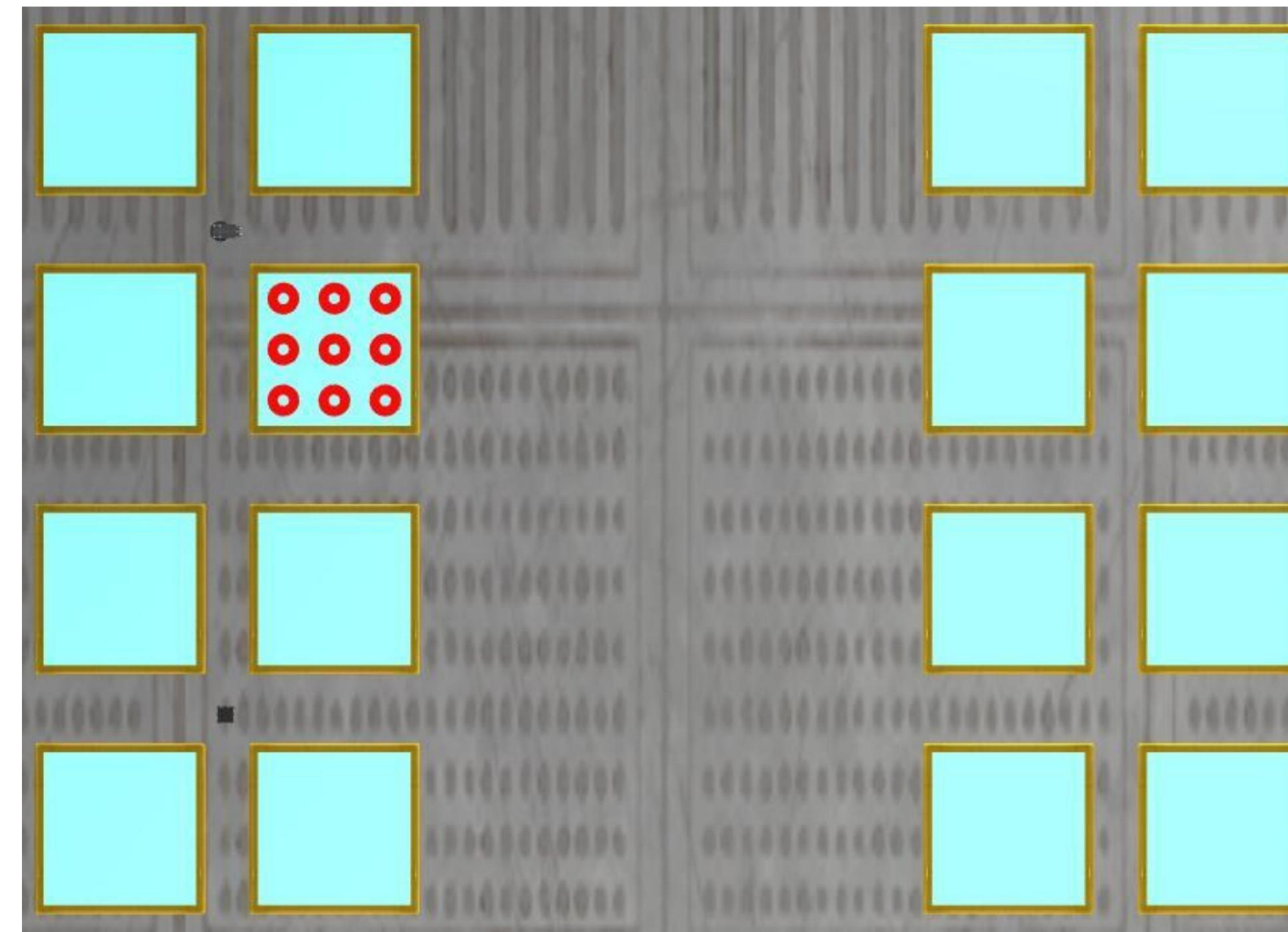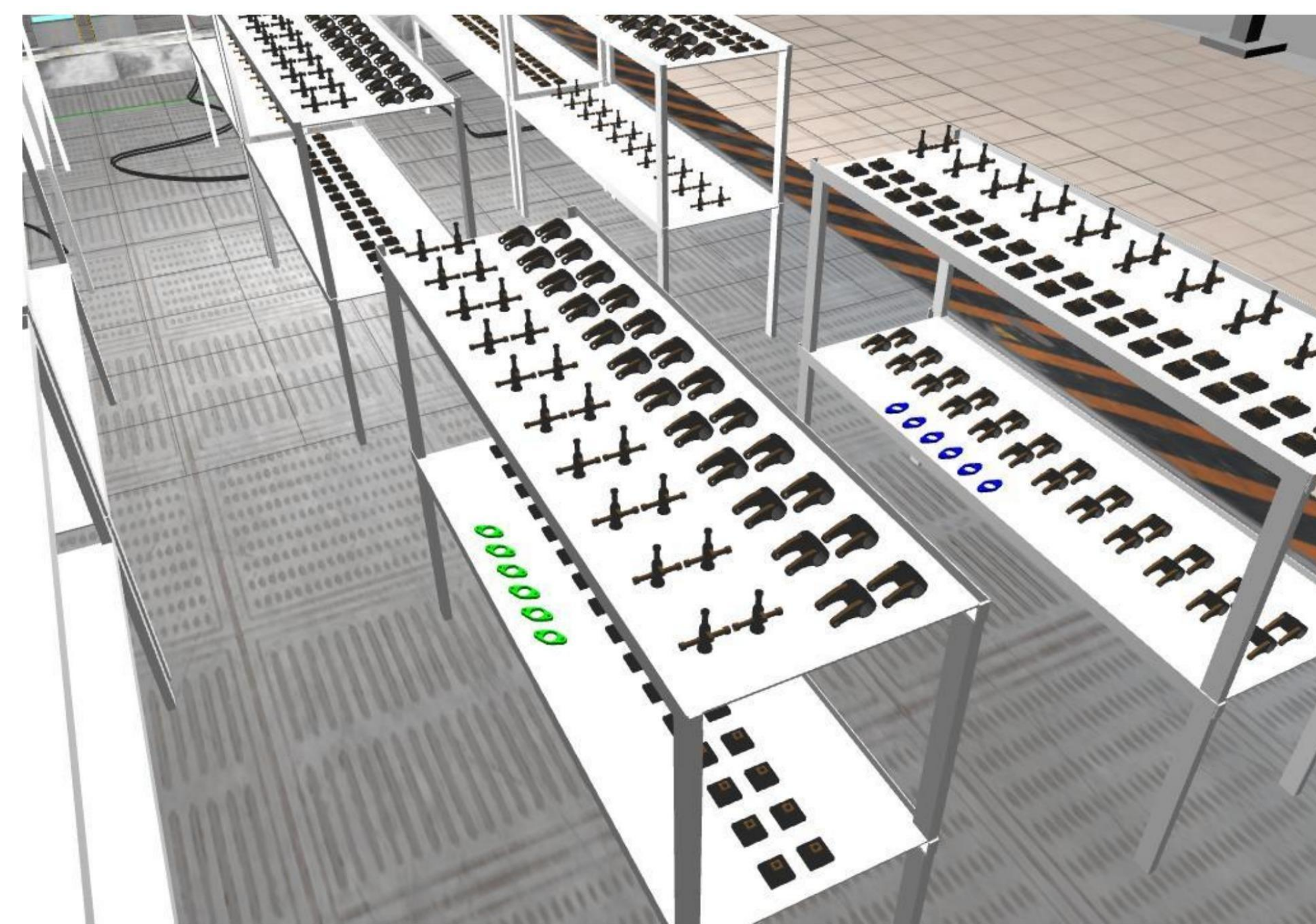- **Time limit**: 500 sim seconds.

Initial Product Placement

Fig. 3: Initial product placements.

- The conveyor belt will spawn a total of 10 green pulleys.

Agility Challenges

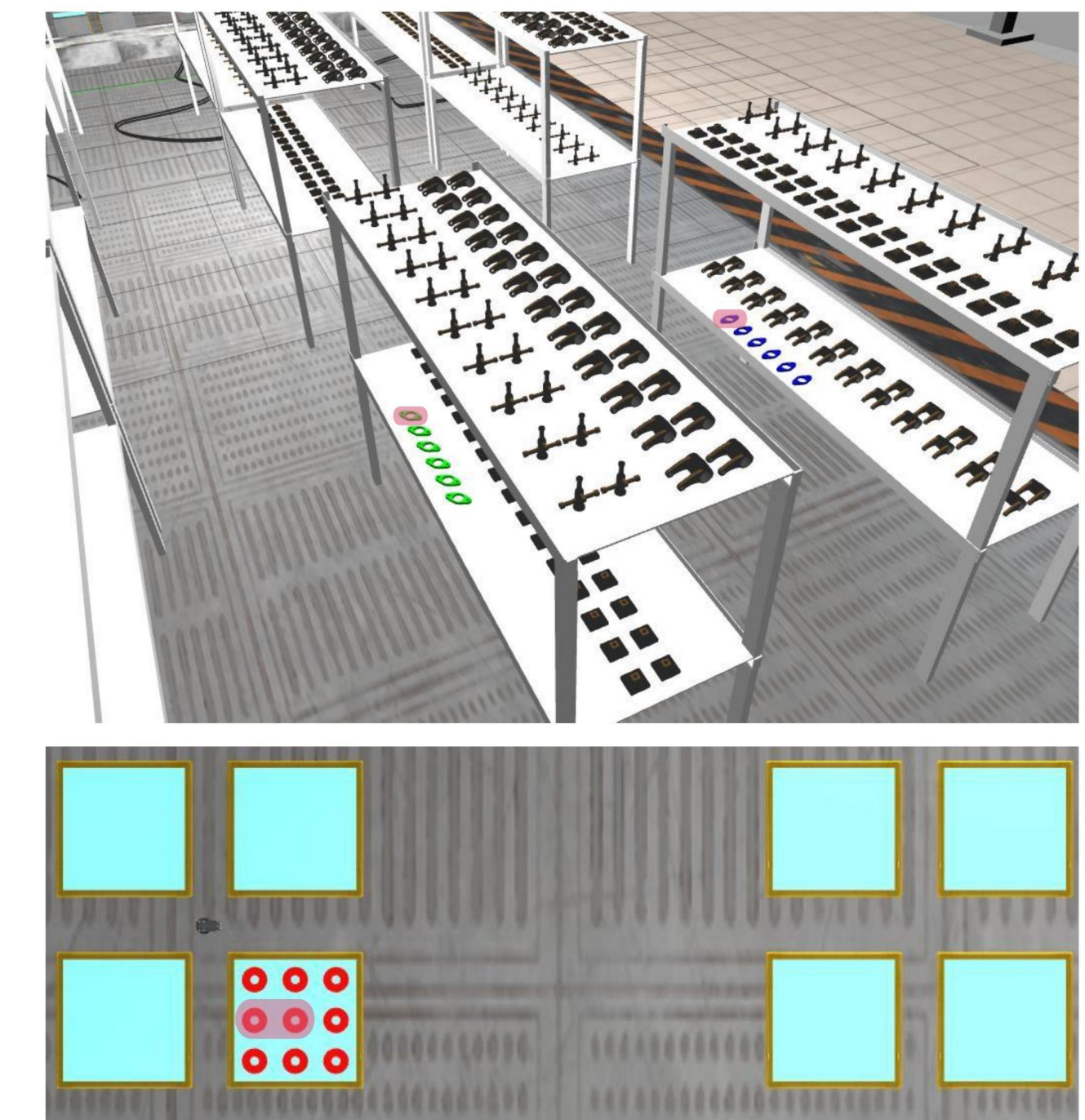- Faulty products: There are 4 faulty products in the environment.

Fig. 4: Faulty products in the environment.

- Flipped products: 1 green pulley must be flipped for order_0::shipment_0. Figure 5 highlights the flipped pulley in this shipment.
- Faulty grippers: A green gasket and a red disk are expected to be dropped over AGV2.
- Sensor blackout: All sensors will stop working for 50 sim seconds after a first product is placed on an AGV.
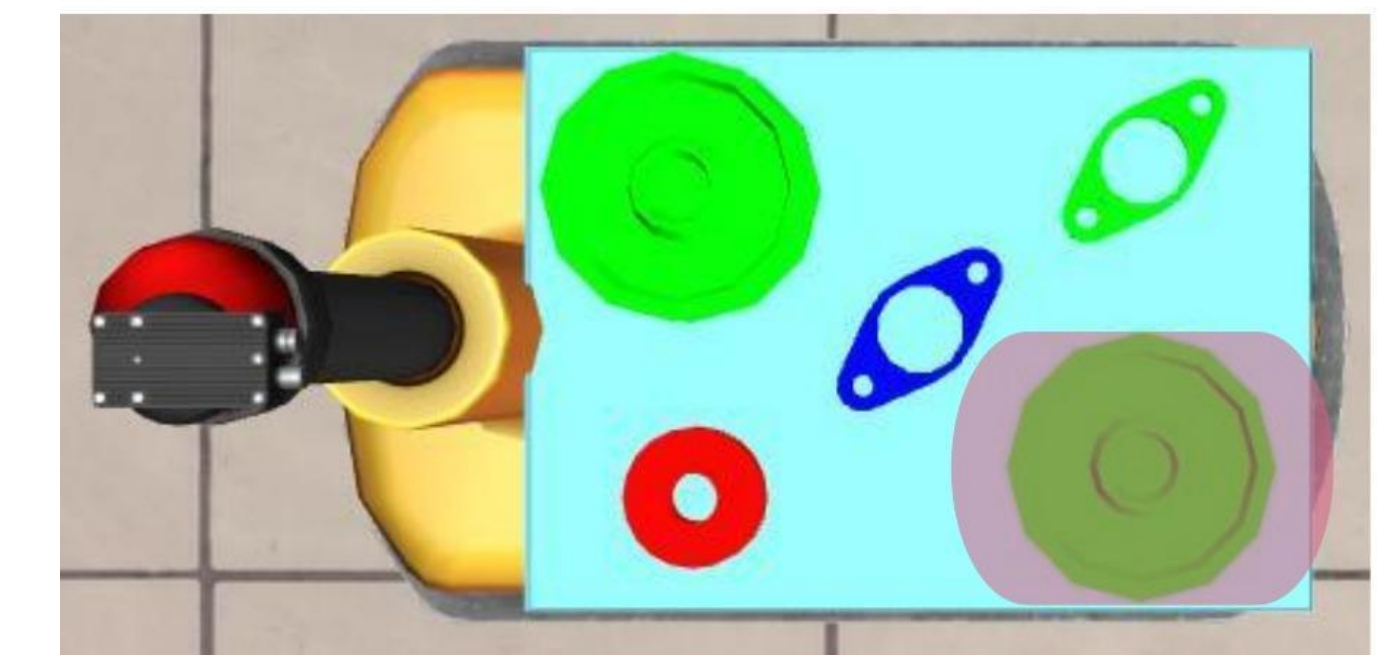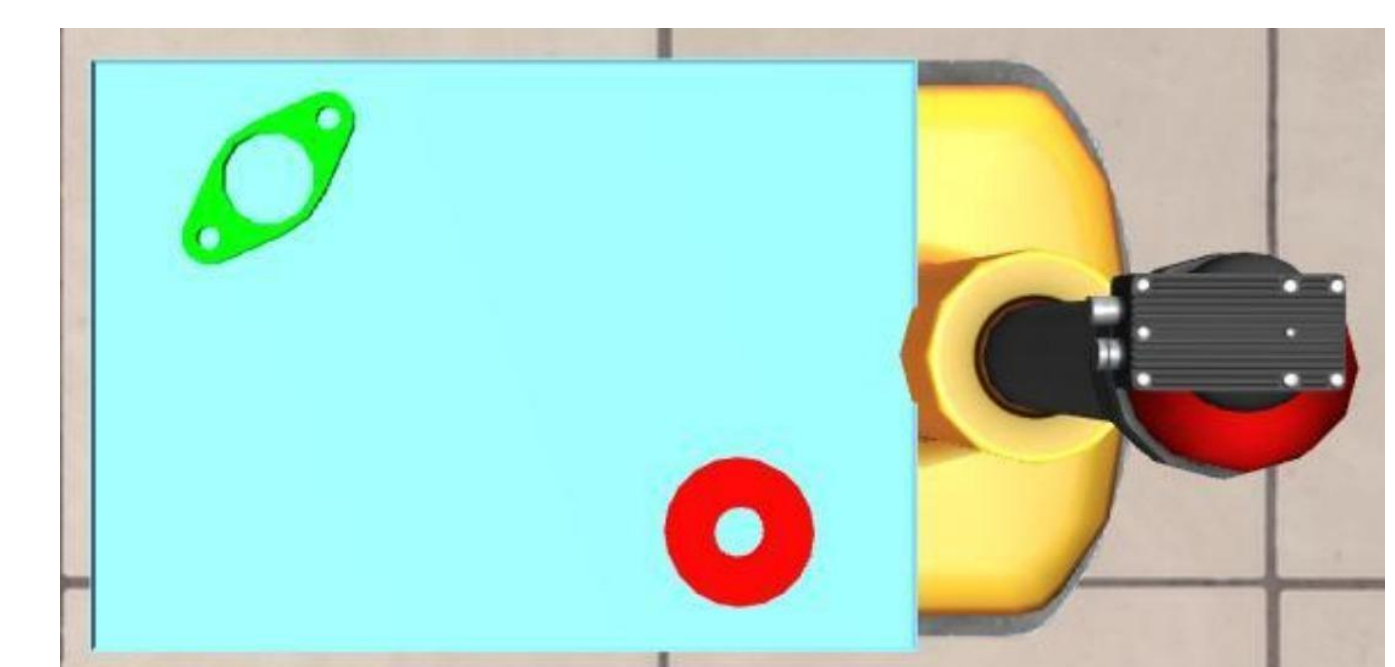
Orders

Fig. 5: order_0 shipment configuration on AGV1.

Fig. 6: order_1 shipment configuration on AGV2.