

# SMART POSITIONING & PROCESS SOLUTIONS



FOR AUTOMATED GUIDED VEHICLES (AGVS)

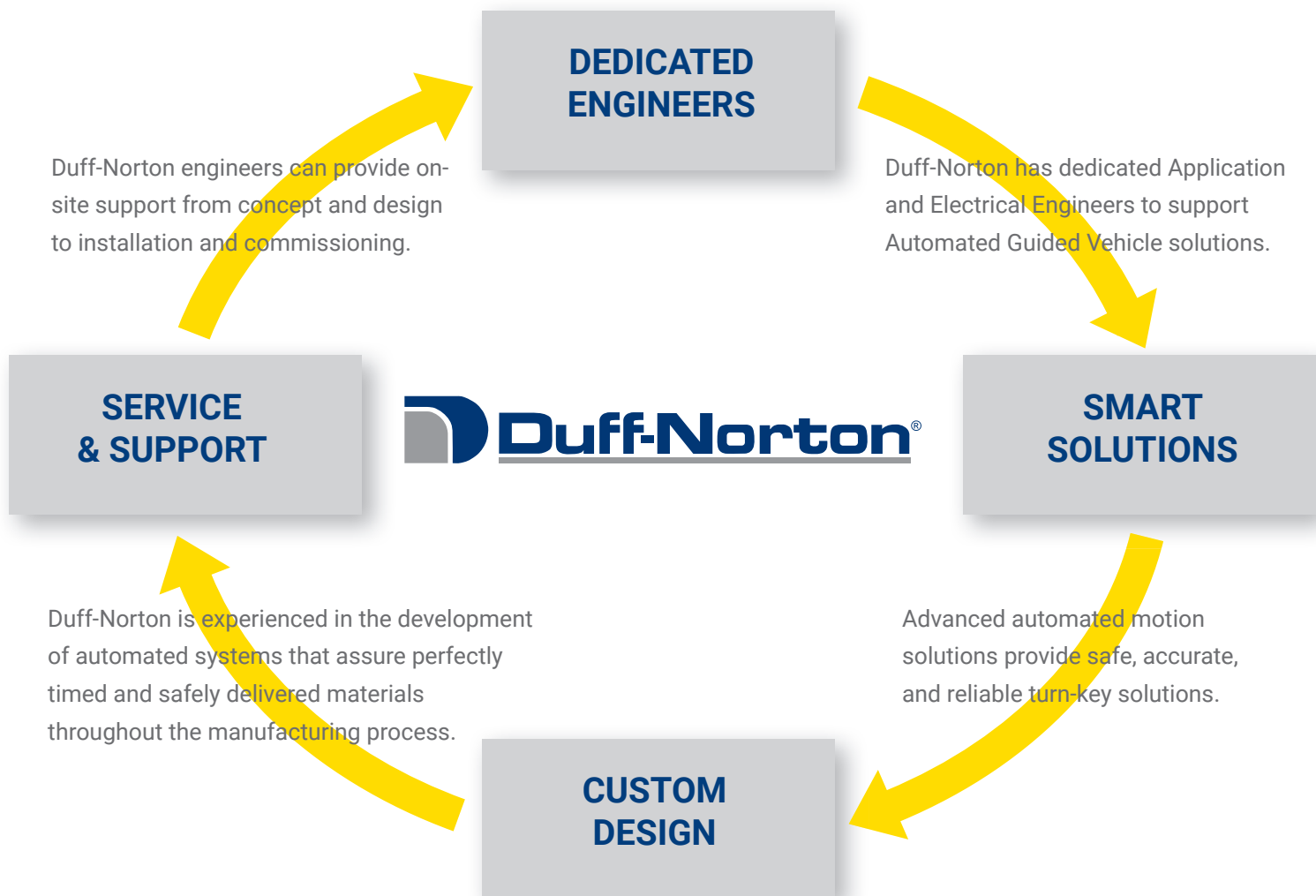


## WHY DUFF-NORTON?

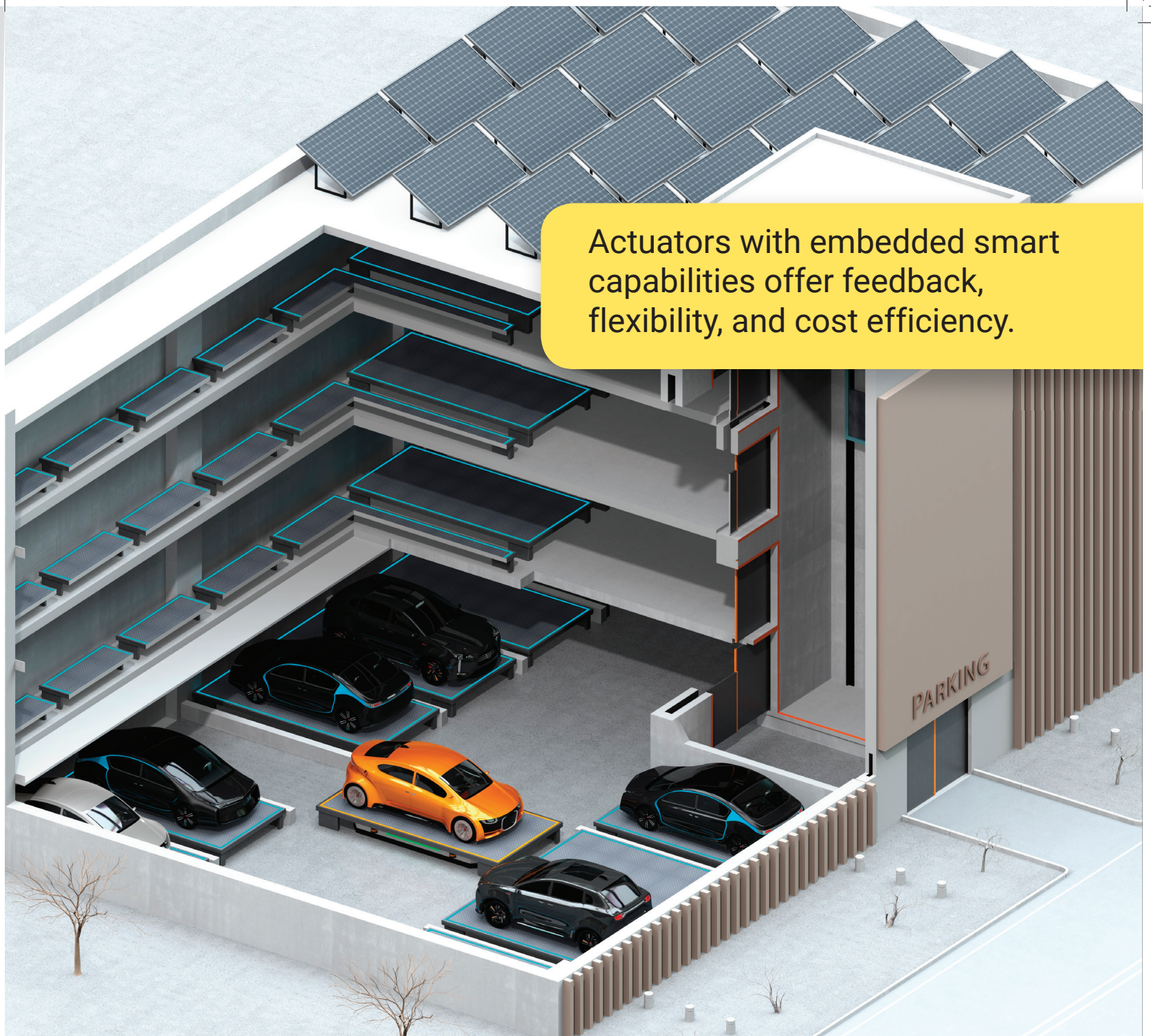
- Duff-Norton products are all life and load tested
- Dedicated application engineers with expertise in custom material handling solutions
- Turn-key motion solutions with UL508a controls
- Engineered and manufactured in Charlotte, NC
- On-site design reviews, field service and commissioning available
- Highly configurable products
- Wide range of loads (25 lbs to 350 tons) and speeds (up to 379 in/min)
- Long life products up to 1,000,000 in. of travel

Many of today's Industry 4.0 applications involve synchronized actuators communicating with other industrial systems in intelligent ways. Their controllability and feedback capabilities increase the reach of smart actuators for use in a variety of automation applications.

## DUFF-NORTON HAS...



**Duff-Norton actuator products are found in AGVs all over the world, used for a wide variety of automated manufacturing and material handling.**



Actuators with embedded smart capabilities offer feedback, flexibility, and cost efficiency.

## SMART ACTUATOR EXPERIENCE & EXPERTISE

### Material handling

- Logistic trains are deploying smart actuators to help increase load capacity, regulate operations, and reduce maintenance. Low-level switching (PLC-compatible), verified positioning and end-of-stroke shutoff are among the features frequently applied in these applications.

### Intermittent load handling

- Raising or lowering a conveyor to handle cartons of various sizes can be handled efficiently with a smart actuators on each axis of motion.

### AGVs/robotics

- AGVs that move around the plant, receiving goods from conveying stations and transporting them to other stages of production or storage, can benefit from smart actuators.

### Synchronized load balancing

- For large work platforms, smart actuators can be synchronized to self-correct as loads shift.

### Position feedback

- Potentiometer or encoder outputs can be used to provide feedback on the actuator's position. This feedback can be fed directly into a PLC.

# DUFF-NORTON MANUFACTURES THE INDUSTRY'S BROADEST RANGE OF ACTUATORS



## LINEAR ACTUATORS

Small actuators with integrated motors.

**25 – 2000 lb. capacity**

An ideal choice for low to medium speed applications that require a small mounting envelope with light loads and light duty cycles.

Linear actuators have a strokes up to 36 inches. They are extremely versatile and work well in both fixed and mobile applications.

## CONTROLS & TURN KEY SOLUTIONS

We know linear motion products and understand the challenges of navigating a dynamic marketplace that demands innovative technologies and the agility to contend with a greater need for increased productivity.

Our industrial experience combined with the latest controls technologies and our broad assortment of linear motion products make us the ideal partner to work closely with you to design and implement your system solutions.

Through our control solutions we can meet the most advanced industrial lifting, positioning, and transfer demands needed to help you gain a competitive advantage in the global marketplace.

## SUPERCYLINDERS

Medium size actuators with integrated motors.

**4,000 – 50,000 lb. capacity**

A great choice for low to high speed applications. SuperCylinders can be mounted clevis to clevis or clevis to trunnion and have stroke lengths from a few inches up to several feet.

Highly configurable with motor mounted encoders, adjustable mechanical limit switches, auxiliary encoders, bellows boots, hazardous condition models, optional ratios, as well as reducer and ball screw options.

An excellent option paired with motor controls. SuperCylinders can be synchronized with multiple actuators, precisely positioned, sustain variable speeds, as well as, have jog and maintained motor control.

## SCREW JACKS (MECHANICAL ACTUATORS)

Small to large actuator.

**1/4 – 350 ton capacity**

Duff-Norton's most versatile and robust actuator. Ideal for low to high duty applications with short to longer strokes. Our extremely customizable modular concept enables unlimited configurations.

Multiple motion solutions include variable speed, synchronization, jogging, and positioning. Multiple feedback options include linear sensors, potentiometers, incremental encoders, and absolute encoders.

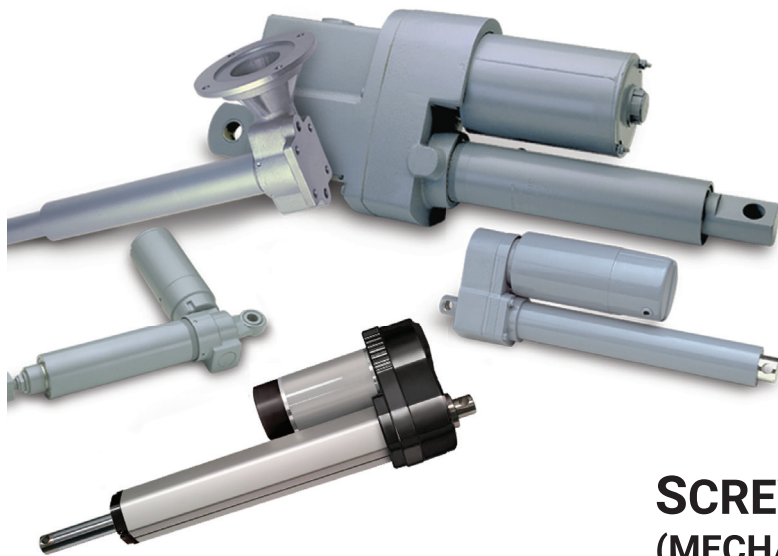
Mechanical actuators are found in aerospace, mining, oil and gas, automotive, water treatment, military, and industrial applications.





**Motion technology today is expected to lift, move and precisely position heavy loads, often under extreme or adverse conditions.**

## LINEAR ACTUATORS



- Capacities from 25 lb to 2000 lb
- Speeds up to 2.8 in/s
- Stroke lengths up to 36 in
- Multiple AC & DC voltages
- Custom actuators available
- Excellent replacement for hydraulic cylinders



## SCREW JACKS (MECHANICAL ACTUATORS)

- Imperial machine screw and ball screw actuators (screw jacks) sizes from 1/4 to 350 ton
- Specialty actuators: stainless steel, anti-backlash, anode jacks, micro-miniature, continuous duty
- Power transmission items: mitre boxes, couplings, connecting shafts, gear reducers, c-motor adaptors, hand wheels
- Broadest range of actuator capacities and types in the industry
- Modular concept enables unlimited configurations

# Your First Choice for Smart Positioning & Process Solutions

Whether it's creating motion to twist and pivot, open and close or keeping a production line moving, the right actuator is key to meeting the demand

## SUPERCYLINDERS



- High speeds up to 379 in/min (160 mm/sec)
- High capacities up to 50,000 lbs (222.5 kN)
- Stroke lengths up to 13 feet (3.96 meters)
- Continuous duty ratings (SCN Series)
- Low power requirements (SCN Series)
- Aluminum bronze worm gears (SCW Series)
- Helical & helical bevel gears (SCN Series)
- Clevis mounting or trunnion mounting
- Controls
- Broadest combination of speeds and capacities in the industry

## CONTROLS & TURN KEY SOLUTIONS



- All Duff-Norton controls are designed to meet UL508A
- NEMA enclosures provided for all applications
- Labeled terminal strip for ease of field connections
- Motor overload protection
- Short circuit protection for all control voltages
- External Main Disconnect Switch (MDS)
- All wires labeled for quick troubleshooting
- Electrical schematics provided for all applications



## OVER A CENTURY OF SMART POSITIONING & PROCESS SOLUTIONS

Since our beginning in 1883, Duff-Norton has earned a reputation for manufacturing reliable, high quality products meeting the industrial lifting, positioning and transfer needs of our worldwide customers. The Duff-Norton team is dedicated to engineering and customer service excellence. This is evident in our ISO 9001 certification and the high level of involvement of our Continuous Improvement Teams.

### WORLDWIDE LOCATIONS



#### Manufacturing & Sales Facilities

- ★ **Duff-Norton** Charlotte, NC USA
- ★ **Duff-Norton Europe** Romeny-sur-Marne, France
- ★ **Pfaff-Silberblau** Kissing, Germany

#### Sales Offices

- Chester, Great Britain
- Beijing, China
- Sao Paulo, Brazil
- Toronto, Canada
- Hyderabad, India
- Johannesburg, South Africa
- Melbourne & Sydney, Australia



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