

# Application Handbook

## Special Machines

### Harmonic Drive LLC

### Weaving Machine Fabric Take-Up Drive

- Special gearbox design

The desire for higher fabric quality is also leading the manufacturers of textile machines, such as weaving machines, to use Harmonic Drive® strain wave gearing. One of the major problems regarding fabric quality is “start-marks”, which are caused by relaxation of the fabric while the machine is at a standstill.

The avoidance of start-marks depends on the accurate control of the fabric tension as the weaving machine reaches normal operating speed. This is achieved by carefully controlling the rotation of the warp let-off drive and the fabric take-up drive. It is very important that the gears used in both these drives do not exhibit stick-slip when rotation commences and that the transmission accuracy is high to ensure even pick spacing. Therefore, Harmonic Drive® strain wave gears are ideally suited to this demanding application.

This design example shows a special gearbox used for the fabric take-up drive in a rapier-weaving machine. The HDUC component set is mounted in a cast-iron housing and is provided with an output shaft. This drives the fabric beam via a spur gear stage. The Wave Generator, as the input element, is mounted directly on the motor shaft.

