

## BL Rotors – L Technology

### Magnets

- Material (usually sintered or compressed NdFeB or SmCo)
- Protection (passivation, Ni, NiCuNi, inorganic coating ...)

### Core

- Laminated
- Sintered
- Solid

### Shaft

- Material according to customer request (X46Cr13 ...)
- Treatment: hardening (inductive, continuous)

### Overmoulding material

- Thermoplastic (PPS ...), thermoset



### Technologies – preferences

- Minor magnets coating needed comparing to "K"
- Very good chemical resistance against aggressive media
- Excellent magnetic characteristics (sintered rare earth magnets)
- Compact design

### Technical characteristics

#### Magnetic characteristics – in case of NdFeB:

- Br from 1T to 1,4T
- Hcj from 800 kA/m to 2.300 kA/m
- Operating temperatures from 80°C to 180°C
- Temperature coefficient Br approx. - 0,12%/°C

#### Magnetic characteristics – in case of SmCo:

- Br from 0,95T to 1,1T
- Hcj from 700 kA/m to 2.000 kA/m
- Maximum temperature 250°C
- Temperature coefficient approx. - 0,035%/°C

#### Mechanical characteristics:

- Imbalance: up to 0,6gmm (depends on the rotor size)
- Axial shift force > 400N (depends on customer request)
- Torque: >1Nm (depends on customer request)
- Good mechanical stability at working speed

#### Corrosion resistance:

Suitable for all major fuels (tested in FAM-B, FAME, E85, RSG-E10, M15, diesel, gasoline)

## BL Rotors – L Technology

### Technical characteristics

#### Magnetic characteristics – NdFeB (injection moulded):

- Br to 700 mT
- Hcj 680 kA/m
- Operating temperature from 80°C to 180°C
- Temperature coefficient Br approx. - 0,12%/°C

#### Mechanical characteristics:

- Imbalance: up to 4 gcm (for outer diameter 90mm), possibility to make constructional imbalance or to reduce imbalance with additional balancing process
- Good mechanical stability at working speed

#### Corrosion resistance:

Without additional protection suitable for dry application



## BL Rotors – L Technology for EPS

### Technical characteristics

#### Magnetic characteristics – in case of NdFeB:

- Br from 1T to 1,4T
- Hcj from 800 kA/m to 2.300 kA/m
- Operating temperatures from 80°C to 180°C
- Temperature coefficient Br approx. - 0,12%/°C

#### Magnetic characteristics – in case of SmCo:

- Br from 0,95T to 1,1T
- Hcj from 700 kA/m to 2.000 kA/m
- Maximum temperature 250°C
- Temperature coefficient approx. - 0,035%/°C

#### Mechanical characteristics:

- Torque: > 4Nm (depends on customer request)
- Good mechanical stability at working speed (bursting speed > 20.000 rpm)
- Low cogging
- Overmoulding thickness < 0,4 mm  
(possible overmoulding with thermoplast or thermoset)

#### Corrosion resistance:

- Without special magnet protection suitable for dry working conditions



## BL Rotors – K Technology

### Magnets

- Material (usually sintered NdFeB or SmCo)
- Protection (Ni, NiCuNi, inorganic coating, epoxy ...)

### Core

- Laminated
- Sintered
- Solid

### Shaft

- Material according to customer request (X46Cr13 ...)
- Treatment: hardening (inductive, continuous)



### Overmoulding material

- Thermoset (phenolic)

### Technologies – preferences

- Min. slot between stator and magnets => better magnetic properties of motor comparing to "L"
- Excellent magnetic characteristics (sintered rare earth magnets)
- Compact design
- Gluing operation not necessary

### Technical characteristics

#### Magnetic characteristics – in case of NdFeB:

- Br from 1T to 1,4T
- Hcj from 800 kA/m to 2.300 kA/m
- Operating temperatures from 80°C to 180°C
- Temperature coefficient Br approx. - 0,12%/°C

#### Magnetic characteristics – in case of SmCo:

- Br from 0,95T to 1,1T
- Hcj from 700kA/m to 2.000 kA/m
- Maximum temperature 250°C
- Temperature coefficient approx. - 0,035%/°C

#### Mechanical characteristics:

- Axial shift force: 1.000N - 5.000N (depends on customer request)
- Torque: > 35Nm (depends on customer request)
- Bursting speed: > 20.000 rpm

#### Corrosion resistance:

- Suitable for different oils (motor oil, gear oil ...). It depends on magnet protection.

## BL Rotors – P Technology

### Magnetic material

- Material (plastomagnetic)

### Core (if required)

- Laminated
- Sintered
- Solid

### Shaft

- Material according to customer request (X46Cr13 ...)
- Treatment: hardening (inductive, continuous)



### Technologies – preferences

- Min. slot between stator and magnets
- Gluing operation not necessary
- In-house development and production of plastomagnetic material
- Special shapes could be moulded
- Imbalances caused through asymmetrical shaft design could be corrected through rotor design adjustment

### Technical characteristics

#### Magnetic characteristics – NdFeB (injection moulded):

- Br to 550 mT
- H<sub>cj</sub> 850 kA/m
- Operating temperature from 80°C to 180°C
- Temperature coefficient Br approx. - 0,12 %/°C

#### Mechanical characteristics:

- Imbalance: up to 0,25 gmm (depends on the rotor size)
- Axial shift force > 400N (depends on customer request)
- Torque: >1 Nm (depends on customer request)
- Good mechanical stability at working speed

#### Corrosion resistance:

- Suitable for all major fuels (tested in FAM-B, FAME, E85, RSG-E10, M15, diesel, gasoline)
- Without additional protection not suitable for fuel containing chlorides

## Anizotropic rotors

### Magnets

- Material (usually injection moulded Ferrite)
- Binders – PPS, PA based

### Other components

- Core or coreless
- Bushings
- Bearings

### Technologies-preferences

- Aligned in magnetic field
- Delivered magnetised or nonmagnetised

### Technical characteristics

#### Magnetical characterisitcs :

- Br from 0.2T to 0.29T
- Hcj from 180kA/m to 240kA/m
- Operating temperatures from 120°C to 200°C
- Temperature coefficient Br approx. - 0,2%/°C

