Forming Rack

Semi-dry machining
Using the Dual Forming Rack together with the Precision Roll Forming Machine PFM-610E supporting semi-dry operation, clean roll forming can be realized.

Long tool life
Even with semi-dry machining, tool life exceeds that of conventional racks using oil coolant.

Energy saving
The oil-less design of the PFM-610E saves up to 70% in energy consumption.

Splines & thread rolling
Semi-dry Forming Rack & Forming machine

- **Dual Forming Rack**
  - Tool surface treated to provide lubrication characteristics
  - Long tool life, both with conventional oil coolant and semi-dry machining

- **Precision Roll Forming Machine PFM610E**
  Oil-less design reduces energy consumption by 70%. Integrated weldment results in compact machine dimensions.
Roll forming machine for semi-dry machining

Nozzle direction aligned with lead of rack

Nozzle
Nozzle

Combines gear surface lubrication and small burr removal

Semi-dry machining achieved
Semi-dry machining (spline rolling)

Even with semi-dry machining, tool life is better than with conventional (oil-based) racks.

Tool life ratio

- Oil
- Water soluble
- Semi-dry
- Dual Forming Rack (semi-dry machining)

Rolling specifications:
- m1.058×PA30×Ng23
- Rolling length: 20mm
- SCM440 (200HB)

Rack:
- 24-inch rack
- Vertical rolling machine

Model:
- PFM610E

Rolling conditions:
- 10m/min

Rolling coolant:
- Semi-dry 12cc/h

Conventional tools
## Semi-dry machining (spline rolling)

<table>
<thead>
<tr>
<th></th>
<th>Wear comparison after 90,000 operations (equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional rack</td>
<td>Finishing tooth edge</td>
</tr>
<tr>
<td>(oil-based machining)</td>
<td><a href="image1.jpg">Image</a></td>
</tr>
<tr>
<td></td>
<td>Rolling specifications: m1.058×PA30×Ng23</td>
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<tr>
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<td>Rack type: 24-inch rack</td>
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<tr>
<td>Dual Forming Rack</td>
<td>Finishing tooth edge</td>
</tr>
<tr>
<td>(semi-dry machining)</td>
<td><a href="image3.jpg">Image</a></td>
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</tbody>
</table>
Semi-dry machining allows for twice the tool life of conventional racks using coolant (oil-based).

**Thread parameters:**
- M22 x P1.5 2 grade
- Screw length 20mm
- SCM440 (200HB)

**Rack type:** 13-inch rack
- Vertical rolling machine

**Model:** PFM610E

**Rolling conditions:** 10m/mm

**Rolling coolant:** Semi-dry 12cc/h
Semi-dry machining (screw)

<table>
<thead>
<tr>
<th>Wear comparison after 50,000 operations (equivalent)</th>
<th>Finishing tooth edge</th>
<th>Roughing tooth edge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional rack (oil-based machining)</td>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
</tr>
<tr>
<td>Dual Forming Rack (semi-dry machining)</td>
<td><img src="image3" alt="Image" /></td>
<td><img src="image4" alt="Image" /></td>
</tr>
</tbody>
</table>

**Screw parameters:**
- M22 x P1.5 2 grade
- Screw length 20mm
- SCM440 (200HB)

**Rack type:** 13-inch rack

**Model:** PFM610E

**Rolling conditions:** 10m/mm

**Rolling coolant:** Semi-dry 12cc/h