



M4R075/750CHD

Example for application

EMCO·TEST
YOUR FACTOR OF SAFETY.



This example for application was created in cooperation with "ZF" (Passau/Germany)

On this occasion we would like to thank again for their cooperation and the trust they have put in us!

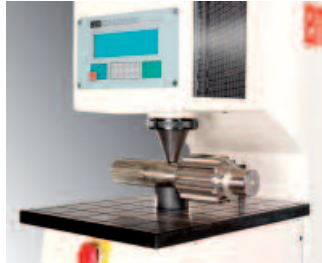
Customer requirements to the hardness tester:

- The basic requirement for the purchase of the hardness tester was the reduction of the machined specimens. The CHD (Eht) system is a testing instrument designed to support the traditional laboratory testing. Therefore, the M4 Eht system enables to reduce the traditional laboratory testing process. It is possible to determine the CHD (Eht) value by means of a depth measurement within one minute. The system works with stored material curves that can be assigned to the corresponding measurement row. The calibration of the material curve is carried out via samples of the same material with as many CHD graduations as possible.

Execution of the hardness testing operation in 3 steps:

- First the diamond (90° cone) travels on the surface with 3 kg and then increases to 30 kg. From this results the test method HR30N that will be converted to HRC afterwards.
- In a second step the test force is increased by between 500 and 750 kg (depending on the workpiece geometries, respectively on the CHD values).
- Now the ecos software determines a CHD (Eht) value by means of the stored material curve. As a result we get 3 central statements:
 - surface hardness in HRC
 - surface decarburization, respectively a graphic about the first 300µ of the indentation process
 - CHD (Eht) value in mm

Example for application of a hardness tester being in operation at ZF:



- Current costs for traditional CHD (Eht) testing amount to € 22,000/ year.
- The costs for testing with the M4-Eht hardness tester, concurrent with the manufacturing process, amount to € 6,000/ year.
- This corresponds to a saving of € 16,000/ year.



System limitations:

- Minimum sample thickness 4 mm, test point approximately 2 mm from the edge of the sample.
- The measurement range is between 0.2 and 1.6 mm.
- Convex or concave workpieces $\varnothing < 8$ mm cannot be tested.
- The clamping surface of the workpiece should be at least 16 mm.



Technical data:

- | | | | |
|-----------------|-----------------|---------------------|--------------------------------|
| ■ M4R075/750CHD | hardness tester | Workpieces to test: | pinions and crown wheels |
| ■ PC010-D | PC components | Test points: | outer surface of the component |
| | | Test method: | CHD depth measurement |
| | | Customer: | ZF Passau (D) |



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