amcoss
components & service

MANUFACTURING OF NEW OPTICAL PARTS

When it comes to optical components, our customers have very specific requirements and need parts that are precisely matched to the performance data of the respective machine usually from Canon, Nikon and ASML. We design, draw, calculate, simulate, manufacture and measure so that you receive customised solutions from us that the OEM cannot usually offer.

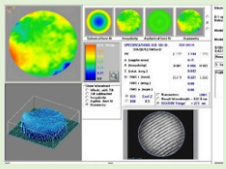
We design and manufacture a great variety of new filters, lenses, glasses and mirrors

Production process & competences at amcoss


Optical design


Specifications


Lens / glass polishing


Surface geometry accuracy, defects


Cleaning


Coating of surfaces

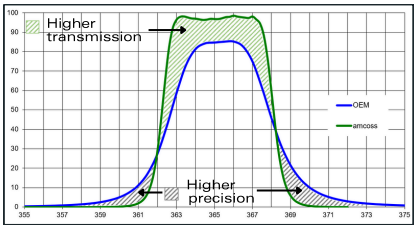

Transmission reflection


Cleanroom assembly


Test bench

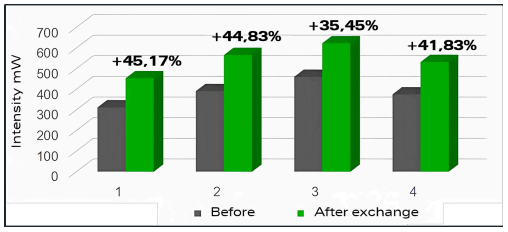

Final cleanroom packaging

Significant improvements in transmission, intensity and uniformity with amcoss optics



New amcoss interference filter for ASML/200

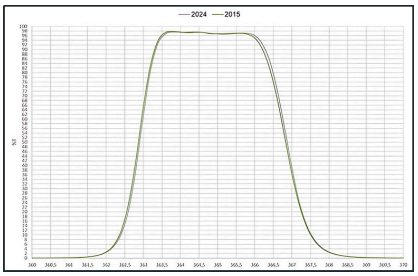
// noticeably higher transmission
// >95% peak transmission
// higher precision in bandpass
// steep slopes
// highest quality at relevant wavelength of 365 nm



amcoss optical parts for Nikon Steppers

In each of 4 steppers 4 OEM parts were replaced by amcoss parts: 1st dichroic mirror, corrector lens, main interference filter, sub-interference filter:

// Remarkable improvement of intensity in all 4 steppers
// Uniformity level changed only negligibly



New amcoss main exposure I-line filter for Canon FPA 3000

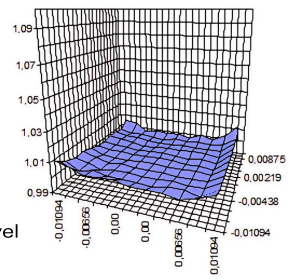
After 9 years of usage no degradation and no wear was observed:

Transmission is still at the same level as directly after production

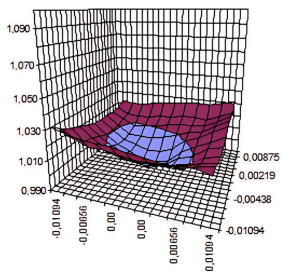
New amcoss digital gradient filter for ASML

Uniformity is more than 2x better than OEM analog filter at the same energy level

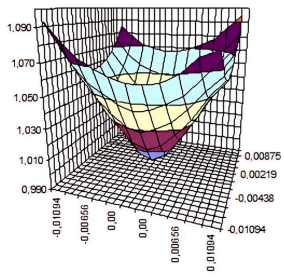
amcoss digital filter



OEM analog filter



Without filter



Total uniformity value (%)	0,8	1,86	4,53
Intensity of energy sensor (mW/cm²)	2564	2565	2679

REFURBISHMENT OF USED OPTICS

The refurbishment of photolithography components makes sense, but requires in-depth expertise and sophisticated capabilities. We at amcoss have these prerequisites. We offer optical and mechanical revisions for various lenses as well as filters, mirrors, reflectors and glasses, mainly from ASML, Canon, and Nikon.
All components are tested in our laboratory for uniformity, intensity, transmission and reflection before delivery. Customised coatings and mechanical processing ensure significant improvements in optical properties and low wear.

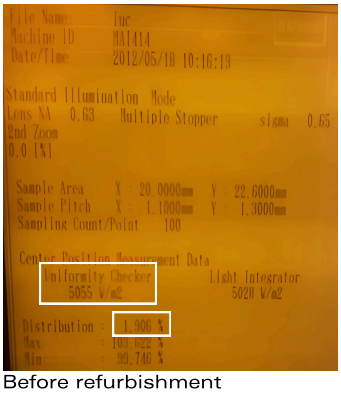
We find solutions for unusual challenges that the original manufacturer often does not offer and where others reach their limits

Significantly improved uniformity of 1st Condenser Lower Lens

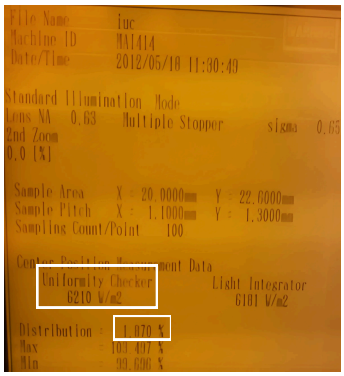
We rework optical parts according to precise customer specifications based on the respective machine data. Accordingly, the coating data is calculated on a customer-specific basis and each part receives its individual coating and other necessary processing, including mechanical machining.
Data from the production process on site confirms the reliability of our work.

Example: Customer machine data, mode 6365 (screenshots)

	Specification	Before refurb	After refurb	Improvement
Intensity (W/m²)	> 5000	5055	6210	**> 21%**
Uniformity (%)	< 2	1,906	1,87	0,03%



Before refurbishment



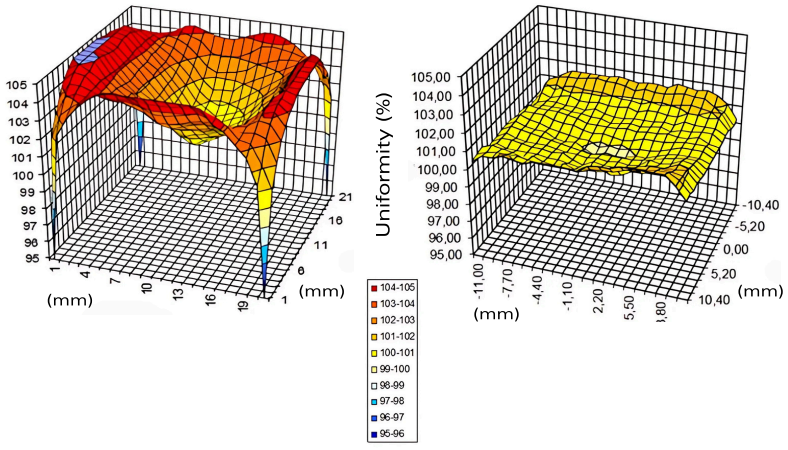
After refurbishment

amcoss 2nd Condenser Lens in Canon i5+ equipment

During the refurbishment process, we convert the OEM B-type 2nd condenser lens (part no. Y60-1693 i5) to an A-type 2nd condenser lens (part no. PS0279). Measurements on the customer's machine confirm the improvements shown in this table.

	Before refurb	After refurb	Improvement
Intensity (W/m²)	7002	7441	> 6%
Uniformity (%)	3,67	1,5	> 2%
Transmission (%)	87	98	11%

Uniformity Profile of refurbished 3rd Condenser Lens from Canon



The graphs of the measurements before and after the rework shows the enormous improvement in the uniformity of the 3rd condenser lens.
In addition, the intensity was increased by more than 25%.

	Before refurb	After refurb	Improvement
Intensity (W/m²)	7564	9583	**> 25%**
Uniformity (%)	3,85	1,09	2,8%

amcoss GmbH | Leusbundtweg 49a | 6800 Feldkirch, Austria | office@amcoss.com
phone +43 5522 209 50 | amcoss.com | amcoss-systems.com