

# Status report about PWO production at CRYTUR

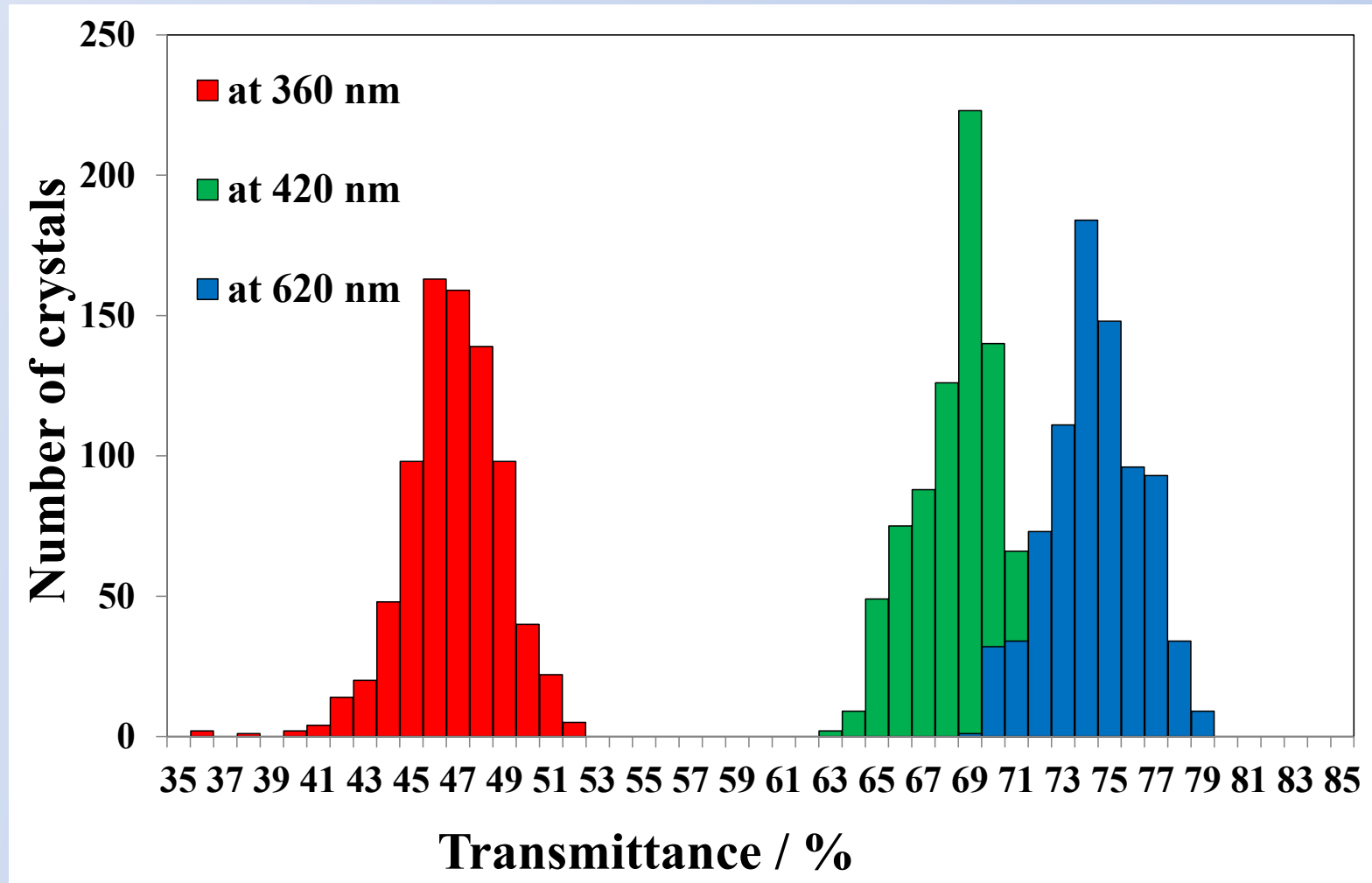
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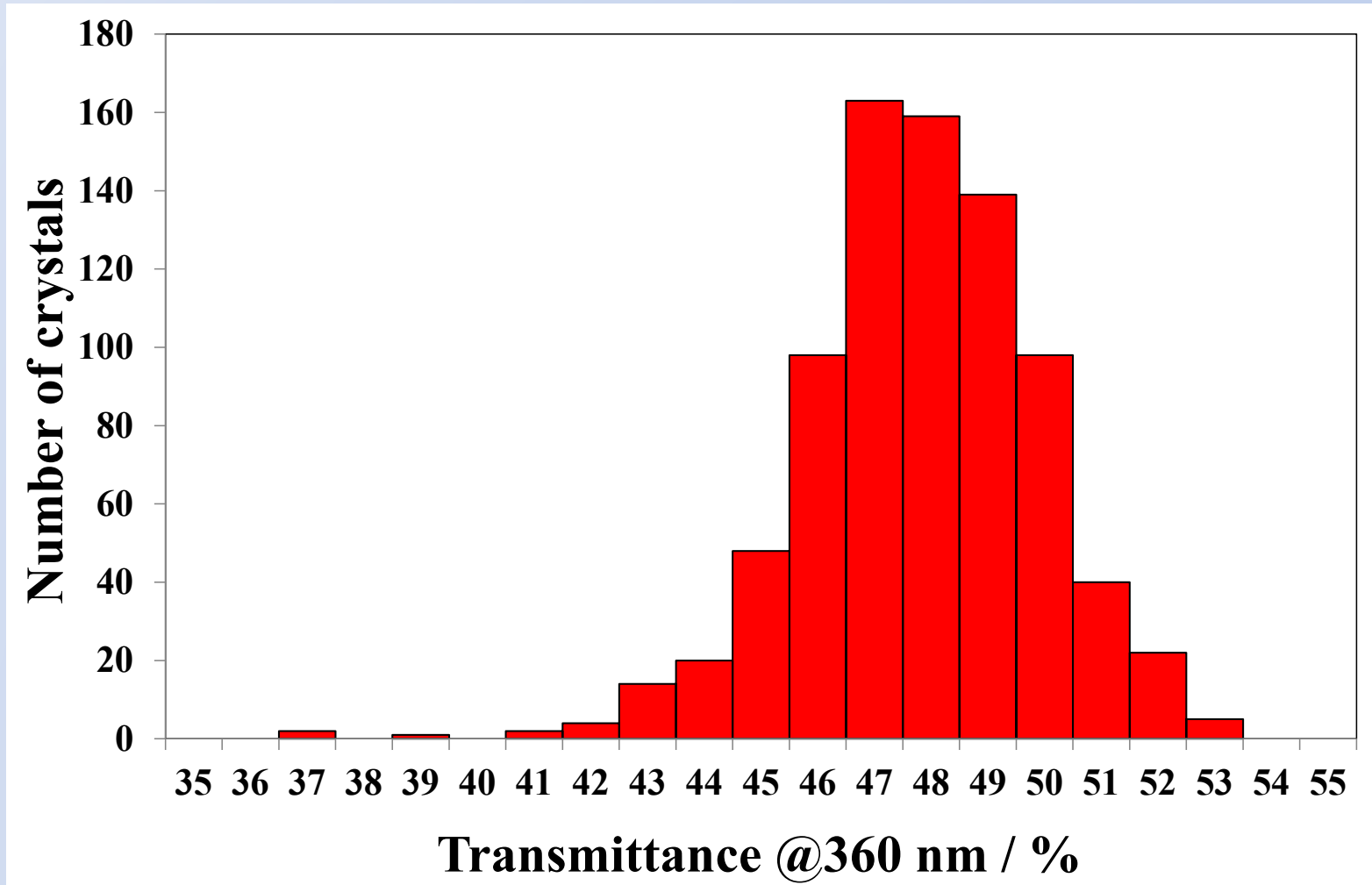
- **CRYTUR starts PWO production in summer 2014**
- **June 2016: The production of crystals with geometry of PANDA EMC was started**
- **824 samples with PANDA geometries were produced by CRYTUR,  
809 samples were accepted**

| TYPE         | Number     | Produced   | Rejected  |
|--------------|------------|------------|-----------|
| 3L           | 74         | 73         | 1         |
| 3R           | 1          | 1          | 0         |
| 4L           | 71         | 71         | 0         |
| 4R           | 69         | 69         | 0         |
| 5L           | 66         | 66         | 0         |
| 5R           | 69         | 69         | 0         |
| 6L           | 53         | 53         | 0         |
| 6R           | 47         | 47         | 0         |
| 7L           | 69         | 69         | 0         |
| 7R           | 69         | 68         | 1         |
| 8L           | 51         | 51         | 0         |
| 8R           | 48         | 48         | 0         |
| 10L          | 6          | 4          | 2         |
| 10R          | 0          | 0          | 0         |
| 11L          | 98         | 88         | 10        |
| 11R          | 33         | 32         | 1         |
| <b>Total</b> | <b>824</b> | <b>809</b> | <b>15</b> |

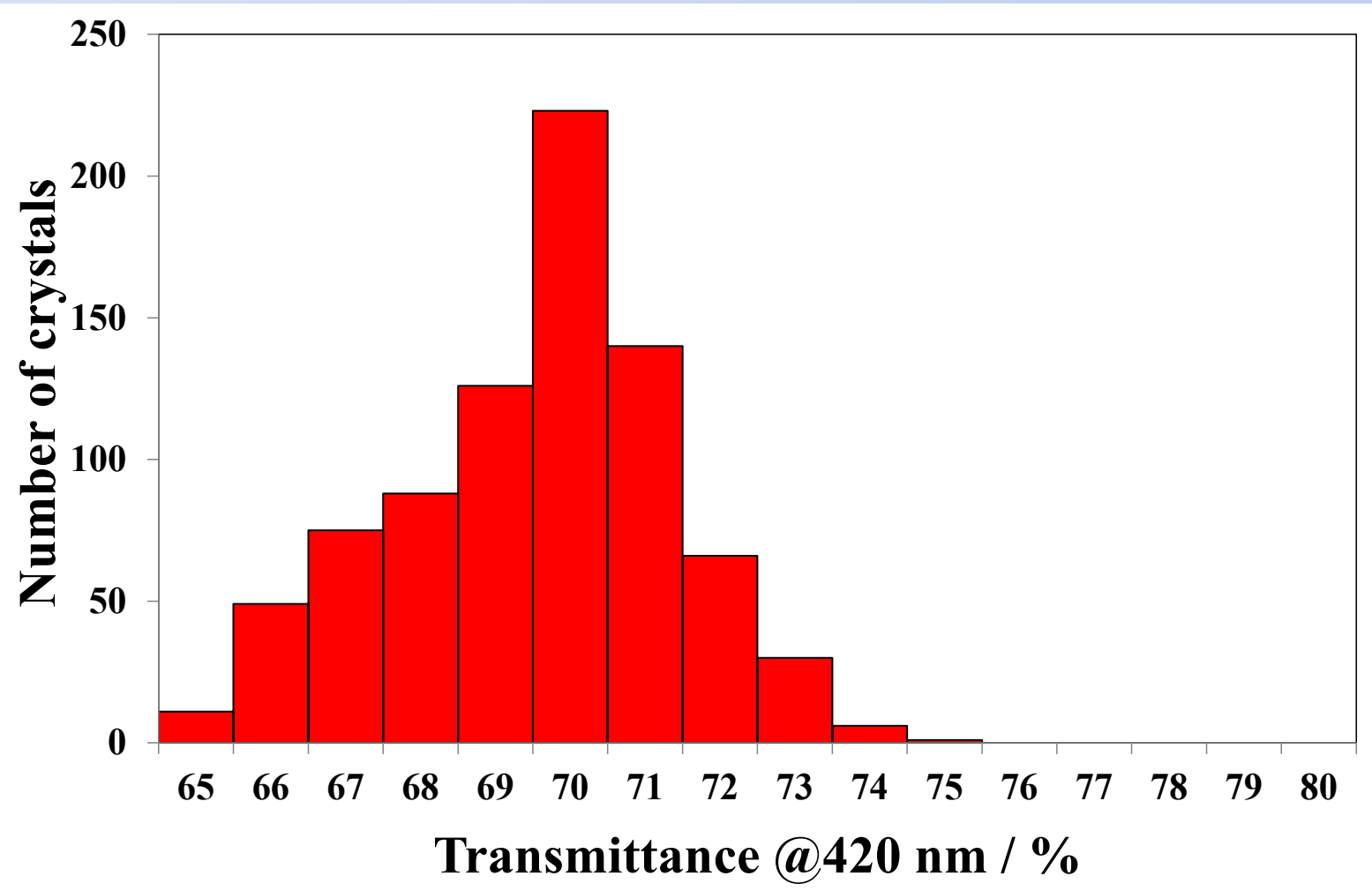
# Distribution of the transmittance



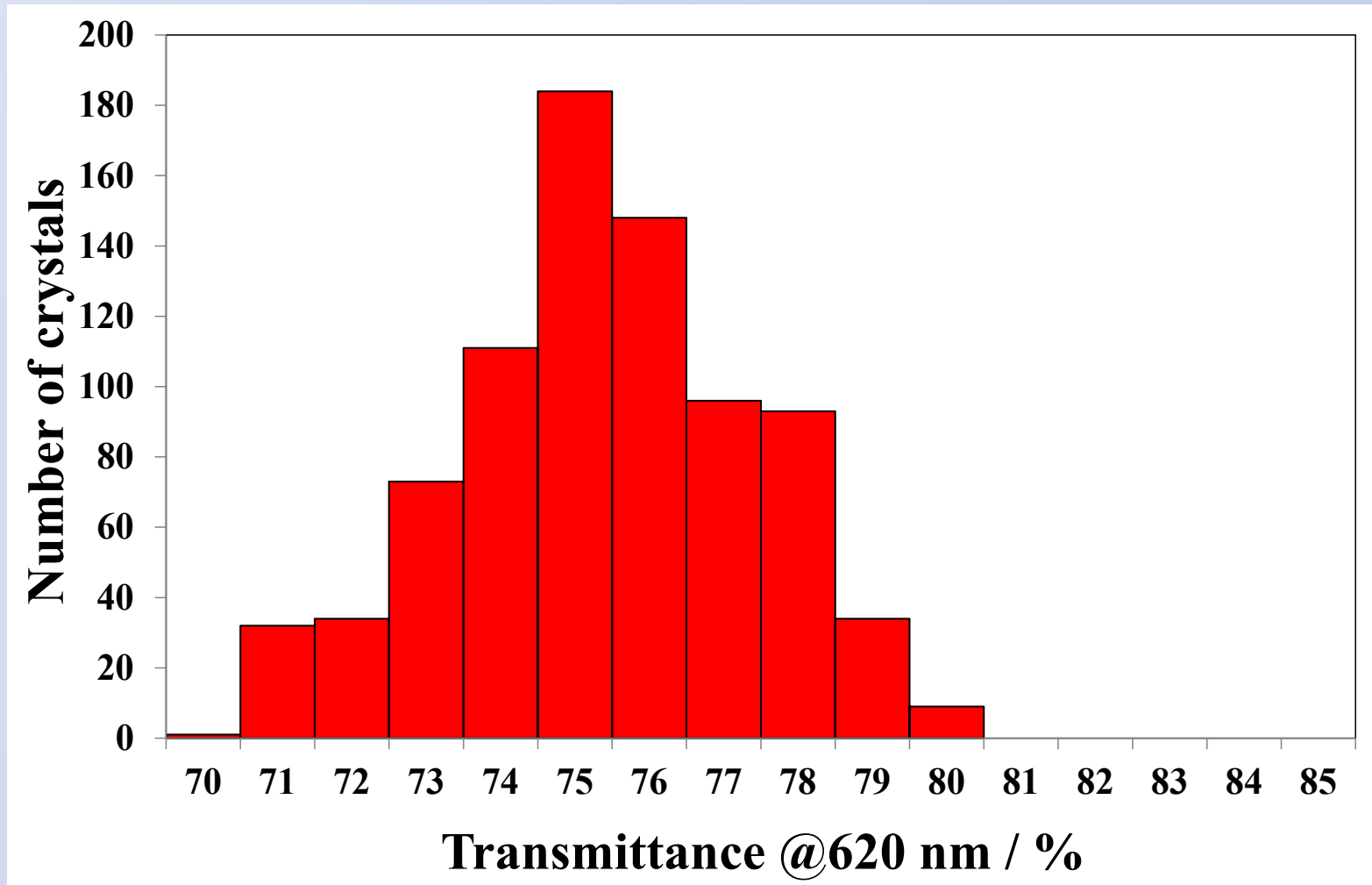
# Distribution of the transmittance @ 360 nm



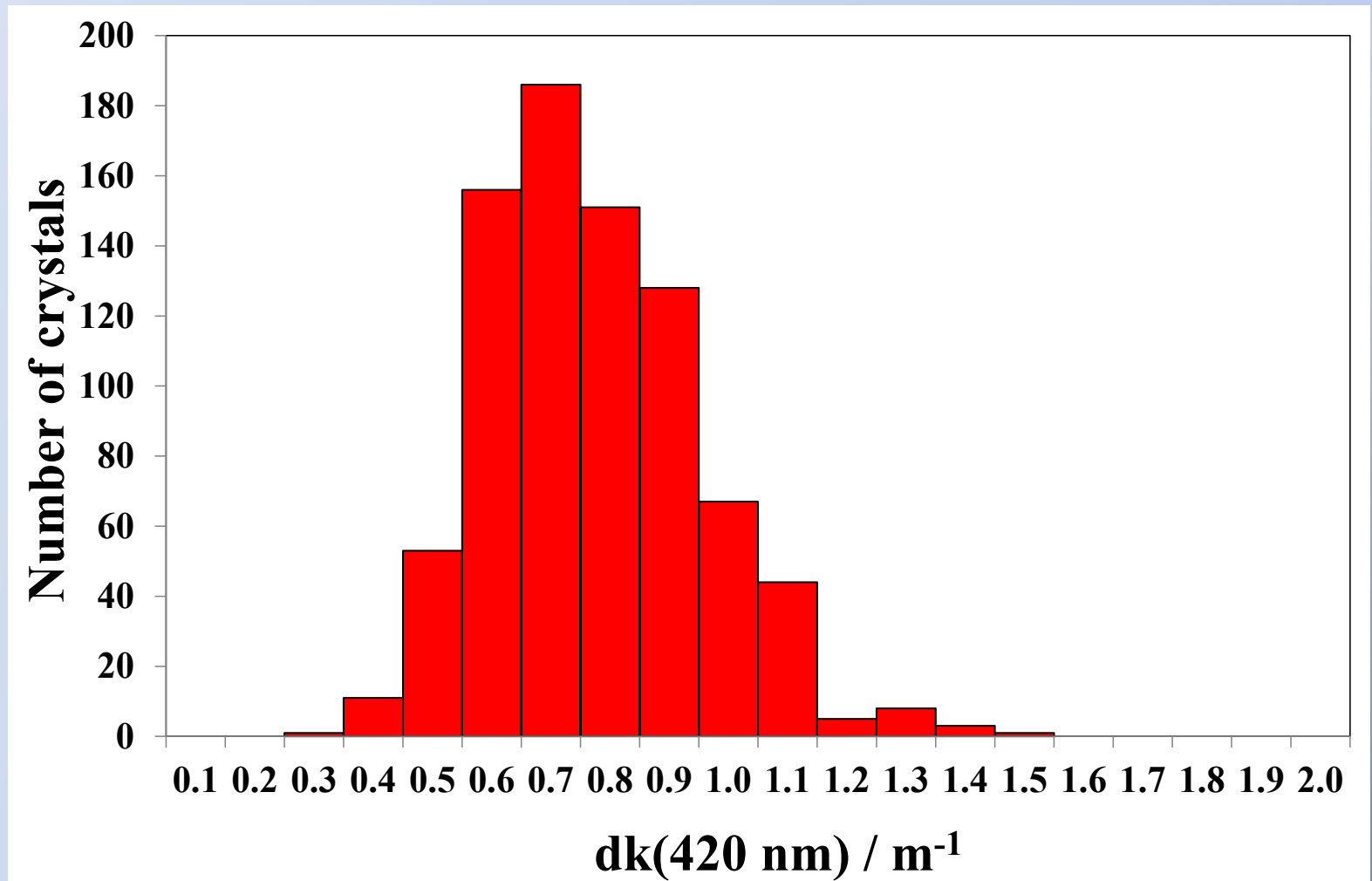
# Distribution of the transmittance @ 420 nm



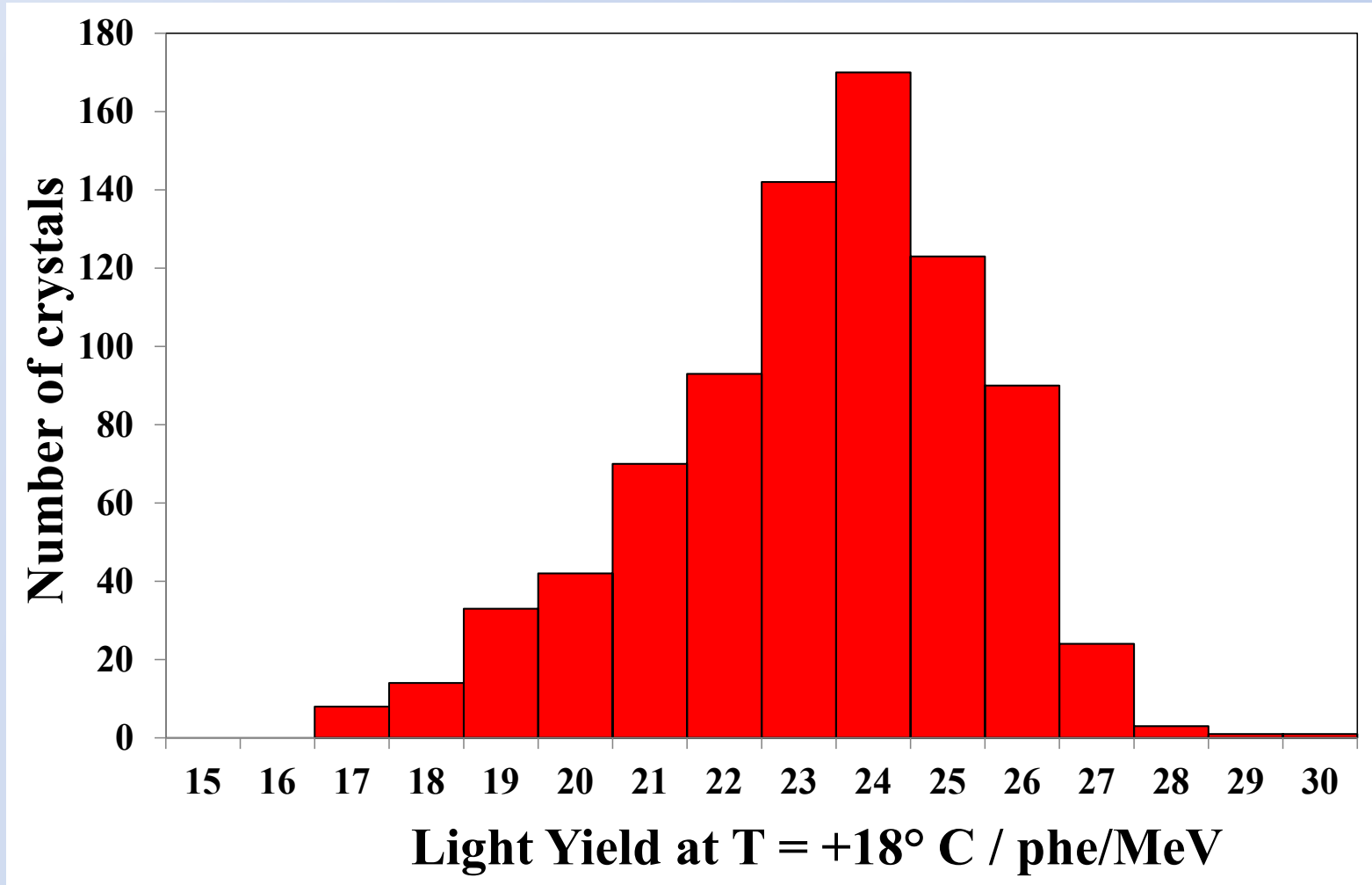
# Distribution of the transmittance @ 620 nm



# Distribution of radiation induced absorption coefficient



# Distribution of the Light Yield





# Crystal production status

- Production for **two slices is completed**
  - **129** crystals (3L, 4L/R, 5L/R, 6L/R, 7L/R types) are needed to complete **3<sup>rd</sup> slice**
  - **402** crystals (3L, 4L/R, 5L/R, 6L/R, 7L/R, 8L/R types) are needed to complete **4<sup>th</sup> slice**
- Number of needed crystals  
 to complete 8 slices : **2158/2225**  
 to complete 12 slices : **3962/4073**  
 to complete 16 slices : **6091**

| type  | total | total+spare         | L   |      | Left    |         |        |        |     |          | Right   |         |        |        |     |          | Missing |      | already financed |      | To be ordered |      |
|-------|-------|---------------------|-----|------|---------|---------|--------|--------|-----|----------|---------|---------|--------|--------|-----|----------|---------|------|------------------|------|---------------|------|
|       |       |                     | R   | BTCP | PreProd | Proto60 | SICCAS | CRYTUR | Tot | BTCP     | PreProd | Proto60 | SICCAS | CRYTUR | Tot | Left     | Right   | Left | Right            | Left | Right         |      |
| 1     | 1280  | 1310                | 655 | 655  | 629     | 36      |        |        |     | 665      | 668     | 35      |        |        |     | 703      | -10     | -48  |                  |      | 0             | 0    |
| 2     | 1280  | 1310                | 655 | 655  | 402     | 34      |        |        |     | 436      | 668     | 38      |        |        |     | 706      | 219     | -51  |                  |      | 219           | 0    |
| 3     | 1280  | 1310                | 655 | 655  |         | 40      |        |        | 73  | 113      | 628     | 37      |        |        | 1   | 666      | 542     | -11  |                  |      | 542           | 0    |
| 4     | 1280  | 1310                | 655 | 655  |         | 40      |        |        | 71  | 111      | 1       | 39      |        |        | 69  | 109      | 544     | 546  |                  |      | 544           | 546  |
| 5     | 1280  | 1310                | 655 | 655  |         | 39      |        |        | 66  | 105      |         | 39      |        |        | 69  | 108      | 550     | 547  |                  |      | 550           | 547  |
| 6     | 1280  | 1310                | 655 | 655  |         | 29      | 30     |        | 53  | 112      |         | 28      | 30     |        | 47  | 105      | 543     | 550  |                  |      | 543           | 550  |
| 7     | 1280  | 1310                | 655 | 655  |         | 39      |        |        | 69  | 108      |         | 39      |        |        | 68  | 107      | 547     | 548  |                  |      | 547           | 548  |
| 8     | 640   | 660                 | 330 | 330  |         | 19      |        |        | 51  | 70       |         | 17      |        |        | 48  | 65       | 260     | 265  |                  |      | 260           | 265  |
| 9     | 640   | 660                 | 330 | 330  | 325     | 20      |        |        |     | 345      | 328     | 19      |        |        |     | 347      | -15     | -17  |                  |      | 0             | 0    |
| 10    | 640   | 660                 | 330 | 330  | 95      | 19      |        |        | 4   | 118      | 285     | 17      |        |        |     | 302      | 212     | 28   |                  |      | 212           | 28   |
| 11    | 480   | 490                 | 245 | 245  |         | 15      |        | 62     | 88  | 165      | 88      | 15      |        |        | 32  | 135      | 80      | 110  |                  |      | 80            | 110  |
|       |       |                     |     |      |         |         |        |        |     | 2348     |         |         |        |        |     | 3353     |         |      |                  |      |               |      |
| total | 11360 | 11640               |     |      | 1451    | 330     | 30     | 62     | 475 |          | 2666    | 323     | 30     | 0      | 334 |          | 3497    | 2594 |                  |      | 3497          | 2594 |
|       |       |                     |     |      |         |         |        |        |     | CRYTUR   |         |         |        |        |     |          |         |      |                  |      |               |      |
|       |       |                     |     |      |         |         |        |        |     | Produced | 5701    |         |        |        |     | 5701     |         |      |                  |      |               |      |
| day-1 | 4134  | Full Barrel         |     |      |         |         |        |        |     |          |         |         |        |        |     | Needed   | 6091    |      |                  |      |               | 6091 |
|       |       | spare : 30 crystals |     |      |         |         |        |        |     |          |         |         |        |        |     |          |         |      |                  |      |               | 5549 |
|       |       | 20 crystals         |     |      |         |         |        |        |     |          | 11792   |         |        |        |     | 8520     |         |      |                  |      |               |      |
|       |       | 10 crystals         |     |      |         |         |        |        |     |          | 5939    |         |        |        |     | 71.49061 |         |      |                  |      |               |      |



# Summary

- 824 crystals with PANDA EMC geometry (3L/R-11L/R) were produced by CRYTUR and tested in Giessen
  - 809 are satisfied to PANDA specification
  - 15 crystals were rejected due to dk(420 nm) values. All other parameters satisfied to PANDA specification
  - Production of 23 crystals as a compensation for raw materials is in progress. After that production for PANDA EMC will be stopped
  - Production for **two slices is completed**
  - **129** crystals (3L, 4L/R, 5L/R, 6L/R, 7L/R, 8L) are needed to complete **3<sup>rd</sup> slice**
  - **402** crystals (3L, 4L/R, 5L/R, 6L/R, 7L/R, 8L/R types) are needed to complete **4<sup>th</sup> slice**
  - Number of needed crystals
- to complete 8 slices : **2225**
- to complete 12 slices : **4073**
- to complete 16 slices : **6091**
- **New contract with CRYTUR is needed**