
Agratechniek b.v.
Lou Nieuwenhuizen
DRYING INSTALLATIONS & EQUIPMENT

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The company Agratechniek was founded in 1974. The objective then and now was and is the development, production and sale of drying and storage systems for the seed industry and growers, flowerbulb growers and arable farmers.

From the very beginning, we have been listening closely to the demands of our users and have been responding to their questions and ideas by providing practical and reliable installations and equipment. Thanks to a service-focused attitude, the quality of advice and products, the know-how and the flexibility.

Agratechniek is a very strong player in various markets throughout the world, but always immediately in your vicinity.

In this brochure you'll find information about (automatically) drying of seed.

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# Absolute Humidity of air

This table shows the Absolute (real) Moist content/Humidity (AH) in the air, related to the different temperatures (T°) and relative Humidity (RH) of the air. AH is in grams per kg air (about 1.1-1.2m³). On top (horizontal) the different RH values. And on the left and right column (vertical) you see the temperature.

Moisture will stay in the air because moisture molecules can move. They can move thanks to the energy in the air. Warm air has more energy and therefore can hold more moisture than cold air. When the air is saturated with moisture (AH maximum) we say; we have 100% moisture content. A lower AH is reported in relation to the maximum moisture content; so 40% RH means that the air contains out of 40% moisture related to the maximum moisture content at that Temperature. Also: Air with 30% RH at 20°C (68°F) is much drier than Air with 30% at 30°C (86°F) (4,4 to 8.15 gr/kg air). Only RH gives no information of the moisture content when temperature is not mentioned!

**Absolute moist content of air (g water / kg air)** — **% Relative Humidity (RH)**

| T° C/F | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | T° C/F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2° \| 35.6° | 0,22 | 0,44 | 0,65 | 0,87 | 1,09 | 1,31 | 1,53 | 1,74 | 1,96 | 2,18 | 2,40 | 2,62 | 2,83 | 3,05 | 3,27 | 3,49 | 3,71 | 3,92 | 4,14 | 4,36 | 2° \| 35.6° |
| 3° \| 37.4° | 0,23 | 0,47 | 0,70 | 0,94 | 1,17 | 1,40 | 1,64 | 1,87 | 2,11 | 2,34 | 2,57 | 2,81 | 3,04 | 3,28 | 3,51 | 3,74 | 3,98 | 4,21 | 4,45 | 4,68 | 3° \| 37.4° |
| 4° \| 39.2° | 0,25 | 0,50 | 0,75 | 1,01 | 1,26 | 1,51 | 1,76 | 2,01 | 2,26 | 2,52 | 2,77 | 3,02 | 3,27 | 3,52 | 3,77 | 4,02 | 4,28 | 4,53 | 4,78 | 5,03 | 4° \| 39.2° |
| 5° \| 41.0° | 0,27 | 0,54 | 0,81 | 1,08 | 1,35 | 1,62 | 1,89 | 2,16 | 2,43 | 2,70 | 2,97 | 3,24 | 3,51 | 3,78 | 4,05 | 4,32 | 4,59 | 4,86 | 5,13 | 5,40 | 5° \| 41.0° |
| 6° \| 42.8° | 0,29 | 0,58 | 0,87 | 1,16 | 1,45 | 1,74 | 2,03 | 2,32 | 2,61 | 2,90 | 3,18 | 3,47 | 3,76 | 4,05 | 4,34 | 4,63 | 4,92 | 5,21 | 5,50 | 5,79 | 6° \| 42.8° |
| 7° \| 44.6° | 0,31 | 0,62 | 0,93 | 1,24 | 1,55 | 1,86 | 2,17 | 2,48 | 2,79 | 3,11 | 3,42 | 3,73 | 4,04 | 4,35 | 4,66 | 4,97 | 5,28 | 5,59 | 5,90 | 6,21 | 7° \| 44.6° |
| 8° \| 46.4° | 0,33 | 0,67 | 1,00 | 1,33 | 1,66 | 2,00 | 2,33 | 2,66 | 2,99 | 3,33 | 3,66 | 3,99 | 4,32 | 4,66 | 4,99 | 5,32 | 5,65 | 5,99 | 6,32 | 6,65 | 8° \| 46.4° |
| 9° \| 48.2° | 0,36 | 0,71 | 1,07 | 1,42 | 1,78 | 2,14 | 2,49 | 2,85 | 3,20 | 3,56 | 3,92 | 4,27 | 4,63 | 4,98 | 5,34 | 5,70 | 6,05 | 6,41 | 6,76 | 7,12 | 9° \| 48.2° |
| 10° \| 50.0° | 0,38 | 0,76 | 1,14 | 1,52 | 1,91 | 2,29 | 2,67 | 3,05 | 3,43 | 3,81 | 4,19 | 4,57 | 4,95 | 5,33 | 5,72 | 6,10 | 6,48 | 6,86 | 7,24 | 7,62 | 10° \| 50.0° |
| 11° \| 51.8° | 0,41 | 0,82 | 1,22 | 1,63 | 2,04 | 2,45 | 2,86 | 3,26 | 3,67 | 4,08 | 4,49 | 4,90 | 5,30 | 5,71 | 6,12 | 6,53 | 6,94 | 7,34 | 7,75 | 8,16 | 11° \| 51.8° |
| 12° \| 53.6° | 0,44 | 0,87 | 1,31 | 1,74 | 2,18 | 2,62 | 3,05 | 3,49 | 3,92 | 4,36 | 4,80 | 5,23 | 5,67 | 6,10 | 6,54 | 6,98 | 7,41 | 7,85 | 8,28 | 8,72 | 12° \| 53.6° |
| 13° \| 55.4° | 0,47 | 0,93 | 1,40 | 1,86 | 2,33 | 2,80 | 3,26 | 3,73 | 4,19 | 4,66 | 5,13 | 5,59 | 6,06 | 6,52 | 6,99 | 7,46 | 7,92 | 8,39 | 8,85 | 9,32 | 13° \| 55.4° |
| 14° \| 57.2° | 0,50 | 1,00 | 1,49 | 1,99 | 2,49 | 2,99 | 3,49 | 3,98 | 4,48 | 4,98 | 5,48 | 5,98 | 6,47 | 6,97 | 7,47 | 7,97 | 8,47 | 8,96 | 9,46 | 9,96 | 14° \| 57.2° |
| 15° \| 59.0° | 0,53 | 1,06 | 1,60 | 2,13 | 2,66 | 3,19 | 3,72 | 4,26 | 4,79 | 5,32 | 5,85 | 6,38 | 6,92 | 7,45 | 7,98 | 8,51 | 9,04 | 9,58 | 10,11 | 10,64 | 15° \| 59.0° |
| 16° \| 60.8° | 0,57 | 1,14 | 1,70 | 2,27 | 2,84 | 3,41 | 3,98 | 4,54 | 5,11 | 5,68 | 6,25 | 6,82 | 7,38 | 7,95 | 8,52 | 9,09 | 9,66 | 10,22 | 10,79 | 11,36 | 16° \| 60.8° |
| 17° \| 62.6° | 0,61 | 1,21 | 1,82 | 2,42 | 3,03 | 3,64 | 4,24 | 4,85 | 5,45 | 6,06 | 6,67 | 7,27 | 7,88 | 8,48 | 9,09 | 9,70 | 10,30 | 10,91 | 11,51 | 12,12 | 17° \| 62.6° |
| 18° \| 64.4° | 0,65 | 1,29 | 1,94 | 2,58 | 3,23 | 3,88 | 4,52 | 5,17 | 5,81 | 6,46 | 7,11 | 7,75 | 8,40 | 9,04 | 9,69 | 10,34 | 10,98 | 11,63 | 12,27 | 12,92 | 18° \| 64.4° |
| 19° \| 66.2° | 0,69 | 1,38 | 2,07 | 2,76 | 3,45 | 4,13 | 4,82 | 5,51 | 6,20 | 6,89 | 7,58 | 8,27 | 8,96 | 9,65 | 10,34 | 11,02 | 11,71 | 12,40 | 13,09 | 13,78 | 19° \| 66.2° |
| 20° \| 68.0° | 0,73 | 1,47 | 2,20 | 2,94 | 3,67 | 4,40 | 5,14 | 5,87 | 6,61 | 7,34 | 8,07 | 8,81 | 9,54 | 10,28 | 11,01 | 11,74 | 12,48 | 13,21 | 13,95 | 14,68 | 20° \| 68.0° |
| 21° \| 69.8° | 0,78 | 1,56 | 2,35 | 3,13 | 3,91 | 4,69 | 5,47 | 6,26 | 7,04 | 7,82 | 8,60 | 9,38 | 10,17 | 10,95 | 11,73 | 12,51 | 13,29 | 14,08 | 14,86 | 15,64 | 21° \| 69.8° |
| 22° \| 71.6° | 0,83 | 1,67 | 2,50 | 3,33 | 4,16 | 5,00 | 5,83 | 6,66 | 7,49 | 8,33 | 9,16 | 9,99 | 10,82 | 11,66 | 12,49 | 13,32 | 14,15 | 14,99 | 15,82 | 16,65 | 22° \| 71.6° |
| 23° \| 73.4° | 0,89 | 1,77 | 2,66 | 3,55 | 4,43 | 5,32 | 6,21 | 7,09 | 7,98 | 8,87 | 9,75 | 10,64 | 11,52 | 12,41 | 13,30 | 14,18 | 15,07 | 15,96 | 16,84 | 17,73 | 23° \| 73.4° |
| 24° \| 75.2° | 0,94 | 1,89 | 2,83 | 3,77 | 4,72 | 5,66 | 6,60 | 7,54 | 8,49 | 9,43 | 10,37 | 11,32 | 12,26 | 13,20 | 14,15 | 15,09 | 16,03 | 16,97 | 17,92 | 18,86 | 24° \| 75.2° |
| 25° \| 77.0° | 1,00 | 2,01 | 3,01 | 4,01 | 5,02 | 6,02 | 7,02 | 8,02 | 9,03 | 10,03 | 11,03 | 12,04 | 13,04 | 14,04 | 15,05 | 16,05 | 17,05 | 18,05 | 19,06 | 20,06 | 25° \| 77.0° |
| 26° \| 78.8° | 1,07 | 2,13 | 3,20 | 4,27 | 5,33 | 6,40 | 7,47 | 8,53 | 9,60 | 10,67 | 11,73 | 12,80 | 13,86 | 14,93 | 16,00 | 17,06 | 18,13 | 19,20 | 20,26 | 21,33 | 26° \| 78.8° |
| 27° \| 80.6° | 1,13 | 2,27 | 3,40 | 4,53 | 5,67 | 6,80 | 7,93 | 9,07 | 10,20 | 11,34 | 12,47 | 13,60 | 14,74 | 15,87 | 17,00 | 18,14 | 19,27 | 20,40 | 21,54 | 22,67 | 27° \| 80.6° |
| 28° \| 82.4° | 1,20 | 2,41 | 3,61 | 4,82 | 6,02 | 7,23 | 8,43 | 9,64 | 10,84 | 12,05 | 13,25 | 14,45 | 15,66 | 16,86 | 18,07 | 19,27 | 20,48 | 21,68 | 22,89 | 24,09 | 28° \| 82.4° |
| 29° \| 84.2° | 1,28 | 2,56 | 3,84 | 5,12 | 6,40 | 7,68 | 8,96 | 10,24 | 11,52 | 12,8 | 14,07 | 15,35 | 16,63 | 17,91 | 19,19 | 20,47 | 21,75 | 23,03 | 24,31 | 25,59 | 29° \| 84.2° |
| 30° \| 86.0° | 1,36 | 2,72 | 4,08 | 5,43 | 6,79 | 8,15 | 9,51 | 10,87 | 12,23 | 13,59 | 14,94 | 16,30 | 17,66 | 19,02 | 20,38 | 21,74 | 23,09 | 24,45 | 25,81 | 27,17 | 30° \| 86.0° |
| 31° \| 87.8° | 1,44 | 2,89 | 4,33 | 5,77 | 7,21 | 8,66 | 10,10 | 11,54 | 12,98 | 14,43 | 15,87 | 17,31 | 18,75 | 20,20 | 21,64 | 23,08 | 24,52 | 25,97 | 27,41 | 28,85 | 31° \| 87.8° |
| 32° \| 89.6° | 1,53 | 3,06 | 4,59 | 6,12 | 7,66 | 9,19 | 10,72 | 12,25 | 13,78 | 15,31 | 16,84 | 18,37 | 19,90 | 21,43 | 22,97 | 24,50 | 26,03 | 27,56 | 29,09 | 30,62 | 32° \| 89.6° |
| 33° \| 91.4° | 1,62 | 3,25 | 4,87 | 6,50 | 8,12 | 9,74 | 11,37 | 12,99 | 14,62 | 16,24 | 17,86 | 19,49 | 21,11 | 22,74 | 24,36 | 25,98 | 27,61 | 29,23 | 30,86 | 32,48 | 33° \| 91.4° |
| 34° \| 93.2° | 1,72 | 3,45 | 5,17 | 6,89 | 8,61 | 10,34 | 12,06 | 13,78 | 15,50 | 17,23 | 18,95 | 20,67 | 22,39 | 24,12 | 25,84 | 27,56 | 29,28 | 31,01 | 32,73 | 34,45 | 34° \| 93.2° |
| 35° \| 95.0° | 1,83 | 3,65 | 5,48 | 7,31 | 9,14 | 10,96 | 12,79 | 14,62 | 16,44 | 18,27 | 20,10 | 21,92 | 23,75 | 25,58 | 27,41 | 29,23 | 31,06 | 32,89 | 34,71 | 36,54 | 35° \| 95.0° |
| 36° \| 96.8° | 1,94 | 3,87 | 5,81 | 7,75 | 9,68 | 11,62 | 13,56 | 15,49 | 17,43 | 19,37 | 21,30 | 23,24 | 25,17 | 27,11 | 29,05 | 30,98 | 32,92 | 34,86 | 36,79 | 38,73 | 36° \| 96.8° |
| 37° \| 98.6° | 2,05 | 4,11 | 6,16 | 8,21 | 10,27 | 12,32 | 14,37 | 16,42 | 18,48 | 20,53 | 22,58 | 24,64 | 26,69 | 28,74 | 30,80 | 32,85 | 34,90 | 36,95 | 39,01 | 41,06 | 37° \| 98.6° |
| 38° \| 100.4° | 2,18 | 4,35 | 6,53 | 8,7 | 10,88 | 13,05 | 15,23 | 17,40 | 19,58 | 21,76 | 23,93 | 26,11 | 28,28 | 30,46 | 32,63 | 34,81 | 36,98 | 41,48 | 41,33 | 43,51 | 38° \| 100.4° |
| 39° \| 102.2° | 2,30 | 4,61 | 6,91 | 9,22 | 11,52 | 13,83 | 16,13 | 18,44 | 20,74 | 23,05 | 25,35 | 27,65 | 29,96 | 32,26 | 34,57 | 36,87 | 39,18 | 41,48 | 43,79 | 46,09 | 39° \| 102.2° |
| 40° \| 104.0° | 2,42 | 4,84 | 7,27 | 9,69 | 12,11 | 14,53 | 16,95 | 19,38 | 21,80 | 24,22 | 26,64 | 29,06 | 31,49 | 33,91 | 36,33 | 38,75 | 41,17 | 43,60 | 47,02 | 48,44 | 40° \| 104.0° |
| T° C/F | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | T° C/F |

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# Equilibrium moisture content of seeds

Table down below gives a clear understanding of the equilibrium moisture (EM) of different crops. Moisture into seeds will be in balance with the moisture content of the surrounding air around the seeds. So the EM of the seeds is dependent on the moisture content of the surrounding air. The moisture content of the seeds will be high when the surrounding air has a high moisture content. Roughly you can say that the moisture content of the seeds will correspond with the EM of the surrounding air.

When the moisture content of the seeds is higher than the surrounding, the moisture will be exuded to the surrounding air. The moist air must be evacuated and refreshed by dry air. This process must be proceeding till the seeds have reached the required EM.

Usually the relative moisture (RM) content of the seeds is measured to determine the moisture content of the seeds. **Please note;** this is only in relation when the temperature of the surrounding air is **25 °C (77°F)**! The EM will give a more secure result when the temperature can fluctuate.

With the ABC processor from Agratechniek you can dry the seeds automatically to the required EM by programming the corresponding RH or EM of the air.

| R.V. at T=25°C (77°F) | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A.V. (gr moist / kg air) | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 | 11.0 | 12.0 | 13.0 | 14.0 | 15.0 | 16.0 | 17.0 | 18.0 | 19.0 | 20.0 |
| Alfalfa | 4.8 | 5.6 | 6.4 | 7.1 | 7.8 | 8.4 | 9.0 | 9.5 | 10.0 | 10.8 | 11.7 | 12.8 | 14.0 | 14.5 | 15.0 | 15.5 | 16.0 | 16.5 | 17.0 |
| Barley | 6.2 | 6.0 | 6.8 | 7.5 | 8.3 | 9.0 | 9.8 | 10.6 | 11.4 | 12.3 | 13.2 | 14.1 | 15.0 | 16.1 | 17.2 | 19.4 | 22.7 | 24.6 | 26.5 |
| Bean | 4.7 | 5.7 | 6.8 | 7.6 | 8.5 | 9.3 | 10.1 | 10.8 | 11.6 | 12.3 | 13.1 | 13.9 | 14.8 | 15.9 | 17.2 | 19.5 | 22.6 | | |
| Bean, French | | 5.0 | 5.5 | 6.0 | 6.5 | 7.1 | 7.8 | 8.5 | 9.2 | 10.1 | 11.0 | 12.0 | 13.0 | 14.0 | 14.5 | 15.0 | 15.6 | 16.2 | 16.7 |
| Bean, Lima | 4.6 | 5.6 | 6.6 | 7.1 | 7.7 | 8.2 | 8.6 | 9.2 | 9.9 | 10.4 | 11.0 | 12.0 | 12.9 | 13.8 | 15.0 | 15.6 | 16.5 | 17.4 | 18.3 |
| Bean, Snap | 3.0 | 3.9 | 4.8 | 5.8 | 6.8 | 7.8 | 8.8 | 9.4 | 10.3 | 11.1 | 12.0 | 13.0 | 14.0 | 15.0 | 16.0 | 16.7 | 17.6 | 18.5 | 19.4 |
| Beet | 2.1 | 3.0 | 4.0 | 4.9 | 5.8 | 6.4 | 7.0 | 7.6 | 8.2 | 8.8 | 9.4 | 10.0 | 10.6 | 11.2 | 15.0 | 12.4 | 13.0 | 13.6 | 14.2 |
| Beet, Garden | 4.7 | 5.8 | 7.0 | 7.8 | 8.6 | 9.2 | 9.8 | 9.9 | 10.1 | 11.4 | 12.7 | 13.6 | 14.6 | 15.5 | 16.5 | 17.4 | 18.4 | 19.3 | 20.3 |
| Buckwheat | 5.7 | 6.7 | 7.6 | 8.1 | 9.1 | 9.8 | 10.5 | 10.8 | 11.4 | 12.0 | 12.7 | 13.5 | 14.2 | 15.0 | 16.5 | 17.5 | 19.1 | 21.8 | 24.5 |
| Cabbage | 3.2 | 3.5 | 4.6 | 5.0 | 5.4 | 5.7 | 6.1 | 6.4 | 6.9 | 7.3 | 7.6 | 8.3 | 8.9 | 9.6 | 10.0 | | | | |
| Cabbage, Chinese | 2.4 | 2.9 | 3.4 | 4.0 | 4.6 | 5.2 | 6.0 | 6.3 | 7.1 | 7.4 | 7.8 | 8.2 | 8.8 | 9.4 | | | | | |
| Capsicum | | 6.0 | 6.3 | 6.5 | 7.0 | 7.0 | 7.0 | 7.3 | 7.5 | 8.2 | 9.0 | 9.6 | 10.4 | 11.0 | | | | | |
| Caraway | 4.7 | 5.2 | 5.7 | 6.2 | 6.7 | 7.2 | 7.8 | 8.4 | 9.0 | 9.6 | 10.3 | 11.1 | 12.0 | 13.0 | 14.5 | 16.5 | 19.8 | | |
| Carrot | 4.4 | 5.1 | 5.8 | 6.2 | 6.9 | 7.4 | 7.9 | 8.4 | 8.9 | 9.4 | 10.0 | 10.9 | 11.9 | 13.0 | 14.2 | | | | |
| Celery | 5.8 | 6.4 | 7.0 | 7.4 | 7.8 | 8.2 | 8.6 | 9.0 | 9.5 | 10.0 | 10.4 | 11.0 | 11.7 | 12.4 | 13.5 | | | | |
| Chicory | | | 4.5 | 5.5 | 6.5 | 7.0 | 7.5 | 8.1 | 8.3 | 8.6 | 8.9 | 9.2 | 9.5 | 10.6 | 11.7 | | | | |
| Chives | 3.4 | 4.2 | 5.1 | 6.0 | 6.9 | 7.6 | 8.5 | 9.4 | 10.2 | 11.1 | 11.8 | 12.6 | 13.3 | 14.0 | 14.8 | 15.5 | 16.2 | 16.9 | 17.6 |
| Clover, Red | | 5.7 | 6.3 | 6.9 | 7.6 | 8.2 | 8.8 | 9.4 | 10.0 | 10.7 | 11.4 | 12.1 | 9.1 | 11.2 | 15.6 | 18.7 | | | |
| Clover, White | | 5.9 | 6.0 | 6.6 | 7.8 | 7.8 | 8.4 | 9.7 | | | | | 8.7 | 10.9 | 15.4 | 18.0 | | | |
| Cocksfoot | | 6.0 | 6.6 | 7.4 | 8.0 | 8.9 | 9.8 | 10.3 | 10.8 | 11.3 | 11.8 | 12.4 | 13.4 | 14.4 | 16.6 | | | | |
| Corn, Dent | 5.1 | 6.6 | 7.2 | 7.8 | 8.4 | 9.1 | 9.7 | 10.4 | 11.2 | 12.0 | 12.9 | 13.5 | 14.1 | 14.7 | 16.2 | 17.4 | 18.9 | 21.7 | 24.6 |
| Corn, Field | | 6.5 | 7.1 | 7.7 | 8.5 | 8.9 | 9.4 | 9.9 | 10.7 | 11.4 | 12.2 | 12.7 | 13.2 | 13.6 | 15.4 | 16.8 | 18.3 | 20.6 | 23.0 |
| Corn, Sweet | 3.8 | 4.8 | 5.8 | 6.4 | 7.0 | 7.7 | 8.4 | 9.0 | 9.5 | 10.0 | 10.6 | 11.4 | 12.0 | 12.8 | 14.0 | | | | |
| Cotton | 3.7 | | 5.2 | | 6.3 | 6.5 | 6.9 | 7.5 | 7.8 | 8.5 | 9.1 | 9.8 | 10.1 | 11.5 | 12.9 | 15.5 | 19.6 | | |
| Cucumber | 2.6 | 3.4 | 4.3 | 4.9 | 5.6 | 6.1 | 6.6 | 7.1 | 7.5 | 7.9 | 8.4 | 9.0 | 9.6 | 10.1 | 10.2 | | | | |
| Egg plant | 3.1 | 4.7 | 4.9 | 5.6 | 6.3 | 6.8 | 7.4 | 8.0 | 8.6 | 9.2 | 9.8 | 10.4 | 11.2 | 11.9 | 12.5 | 13.1 | 13.7 | 14.3 | 14.9 |
| Endive | 3.5 | 4.0 | 4.5 | 5.2 | 6.0 | 6.2 | 6.4 | 6.6 | 6.8 | 7.7 | 8.7 | 9.3 | 9.9 | 11.5 | 13.2 | 14.1 | 15.0 | 15.9 | 16.8 |
| Fescue, Red | 3.8 | | | | 7.0 | 8.0 | 8.8 | 9.6 | 10.3 | 10.9 | 11.6 | 12.6 | 13.8 | 15.3 | 17.3 | 19.8 | 23.1 | | |
| A.V. (gr moist / kg air) | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 | 11.0 | 12.0 | 13.0 | 14.0 | 15.0 | 16.0 | 17.0 | 18.0 | 19.0 | 20.0 |
| R.V. at T=25°C (77°F) | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |

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# Equilibrium moisture content of seeds

| R.V. at T=25°C (77°F) | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A.V. (gr moist / kg air) | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 | 11.0 | 12.0 | 13.0 | 14.0 | 15.0 | 16.0 | 17.0 | 18.0 | 19.0 | 20.0 |
| Fescue, Tall | | 6.5 | 7.3 | 8.0 | 8.7 | 9.5 | 10.2 | 10.9 | 11.2 | 11.5 | 11.7 | 11.9 | 12.5 | 13.2 | 15.0 | 17.3 | | | |
| Flax | 3.3 | 4.4 | 4.9 | 5.2 | 5.6 | 5.8 | 6.1 | 6.3 | 6.8 | 7.3 | 7.9 | 8.6 | 9.3 | 10.0 | 11.4 | 13.9 | 15.2 | 18.3 | 21.4 |
| Garden Cress | 1.9 | 2.8 | 3.7 | 4.6 | 5.5 | 6.4 | 7.3 | 8.2 | 9.1 | 9.5 | 10.0 | 11.0 | 12.0 | 13.0 | 14.0 | 15.0 | 16.0 | 17.0 | 18.0 |
| Grass, Common Bent- | | 6.3 | 6.4 | 6.6 | 6.7 | 7.3 | 7.9 | 8.5 | 9.2 | 9.8 | 10.5 | 11.3 | 12.1 | 13.0 | 14.4 | 16.2 | 19.2 | | |
| Grass, Creeping Bent- | | 6.3 | | | 8.2 | | | 10.2 | | 9.7 | | 10.8 | 11.3 | 12.7 | 14.3 | 16.4 | | | |
| Grass, Intermediate Rye- | | 7.1 | 7.8 | 8.4 | 9.1 | 9.8 | 10.5 | 11.0 | | 9.4 | | | 11.9 | 12.9 | 13.9 | 16.2 | | | |
| Grass, Italian Rye- | | 6.5 | 7.2 | 7.9 | 8.6 | 9.2 | 10.0 | 10.7 | | 11.2 | 12.5 | 13.0 | 13.8 | 15.0 | 15.7 | 16.3 | | | |
| Grass, Perennial Rye- | 4.5 | 5.5 | 6.5 | 6.8 | 7.6 | 8.8 | 9.1 | 9.9 | 10.6 | 11.2 | 12.5 | 12.9 | 14.2 | 15.3 | 17.1 | 19.9 | 23.3 | | |
| Grass, Reed canary | | | | | | | | | | 11.4 | | 12.0 | 12.5 | 13.5 | 14.7 | 15.7 | | | |
| Grass, Smooth Meadow | 5.9 | 6.2 | 6.5 | 6.8 | 7.5 | 8.3 | 9.0 | 9.7 | 10.5 | 11.2 | 12.0 | 12.8 | 13.5 | 14.6 | 16.1 | 18.1 | 21.3 | | |
| Groundnut | 3.0 | 2.6 | 3.9 | 3.7 | 4.2 | 4.7 | 5.1 | 5.6 | 5.9 | 6.7 | 7.0 | 8.1 | 8.5 | 9.8 | 11.1 | 12.0 | 17.2 | 13.9 | 15.0 |
| Lettuce | 3.0 | 4.0 | 4.2 | 4.6 | 5.0 | 5.4 | 5.9 | 6.3 | 6.7 | 7.15 | 7.6 | 8.3 | 9.1 | 9.6 | | | | | |
| Linseed | 3.3 | 4.4 | 4.9 | 5.2 | 5.6 | 5.8 | 6.1 | 6.4 | 6.8 | 7.9 | 8.3 | 8.9 | 9.3 | 10.0 | 12.4 | 14.5 | 15.2 | | |
| Lupin, Yellow | 4.2 | 5.2 | 6.2 | 7.0 | 7.8 | 8.4 | 9.1 | 9.8 | 10.5 | 22.2 | 11.7 | 12.5 | 13.4 | 14.5 | 16.7 | | >25 | | |
| Maize | 6.2 | 6.4 | 7.9 | 8.6 | 9.3 | 10.0 | 10.7 | 11.3 | 11.9 | 12.5 | 13.1 | 13.8 | 14.6 | 15.5 | 16.5 | 18.6 | 20.7 | | |
| Maize, Shelled | | | | | 8.3 | | 9.8 | | 11.2 | | 12.9 | | 14.0 | | 15.6 | | 19.6 | | 23.8 |
| Mustard | 1.8 | 4.0 | 3.2 | 4.4 | 4.6 | 5.2 | 5.8 | 6.3 | 6.7 | 7.2 | 7.8 | 8.3 | 8.9 | 9.4 | | | | | |
| Oats | 5.6 | 7.2 | 7.6 | 8.0 | 8.4 | 8.7 | 9.9 | 10.2 | 11.2 | 11.7 | 12.5 | 13.3 | 14.3 | 15.3 | 16.8 | 18.6 | 22.3 | | 24.1 |
| Legumes | 3.8 | 7.5 | 7.2 | 8.1 | 8.3 | 8.7 | 9.9 | 10.0 | 11.2 | 11.7 | 11.2 | 13.3 | 14.3 | 13.1 | 14.5 | 18.6 | 22.3 | | |
| Onion | 4.6 | 5.7 | 6.8 | 7.4 | 8.0 | 8.5 | 9.0 | 9.5 | 10.0 | 10.6 | 11.2 | 11.9 | 12.6 | 13.4 | 13.6 | | | | |
| Onion, Welsh | 3.4 | 4.2 | 5.1 | 6.0 | 6.9 | 7.7 | 8.8 | 9.4 | 10.3 | 10.9 | 11.8 | 12.6 | 13.4 | 14.0 | | | | | |
| Opium poppy | | | | 4.4 | 4.9 | 5.4 | 5.9 | 6.3 | 6.9 | 7.4 | 8.0 | 8.7 | 9.5 | 10.3 | 11.7 | 13.7 | 17.0 | | |
| Parsley | | | 5.7 | 6.0 | 6.4 | 7.1 | 7.9 | 8.0 | 8.2 | 9.0 | 9.9 | 10.5 | 11.1 | | | | | | |
| Parsnip | 5.0 | 5.5 | 6.1 | 6.5 | 7.0 | 7.4 | 7.8 | 8.2 | 8.6 | 9.0 | 9.5 | 10.1 | 10.6 | 11.2 | | | | | |
| Pea | 5.4 | 6.1 | 7.3 | 7.8 | 8.6 | 9.4 | 10.3 | 11.1 | 11.9 | 12.7 | 13.5 | 14.2 | 15.0 | 15.9 | 17.1 | 19.0 | 22.0 | | |
| Pepper | 2.8 | 3.6 | 4.5 | 5.2 | 6.0 | 6.6 | 7.2 | 7.8 | 8.3 | 8.7 | 9.2 | 9.8 | 10.4 | 11.0 | 12.0 | | | | 18.6 |
| Poppy-seed | 2.9 | 3.4 | 3.9 | 4.4 | 4.9 | 5.4 | 5.9 | 6.3 | 6.9 | 7.4 | 8.0 | 8.7 | 9.5 | 10.3 | 11.7 | 13.7 | 17.0 | 17.8 | |
| Pumpelly's Brome | | 6.6 | | | 9.0 | | | 11.5 | | 11.0 | | 12.5 | 13.1 | 13.7 | 16.1 | 18.4 | | | |
| Purslane | | | | | | 8.6 | 9.6 | 10.7 | 11.9 | 12.6 | 13.3 | 13.5 | 13.8 | | | | | | |
| Radish | 2.6 | 3.2 | 3.8 | 4.4 | 5.1 | 5.7 | 6.2 | 6.8 | 7.3 | 7.8 | 8.3 | 8.9 | 9.5 | 10.2 | | | | | |
| Rapeseed | 3.1 | 3.5 | 3.9 | 4.4 | 4.7 | 5.3 | 5.5 | 6.2 | 6.3 | 7.0 | 7.3 | 8.0 | 8.4 | 9.1 | 10.1 | 12.0 | | | |
| Rice | | 5.9 | 7.6 | 8.2 | 8.6 | 9.6 | 10.2 | 10.7 | 11.3 | 11.9 | 12.8 | 13.3 | 13.8 | 14.6 | 15.8 | 16.8 | 18.4 | 20.8 | |
| Rye | | 7.0 | 7.6 | 8.2 | 8.7 | 9.4 | 10.0 | 10.5 | 11.1 | 11.7 | 12.2 | 13.1 | 13.9 | 14.8 | 16.6 | 18.5 | 20.6 | 23.6 | |
| Salad, Corn- | | | | | 7.1 | 7.7 | 8.2 | 8.8 | 9.0 | 9.2 | 10.0 | 10.8 | | | | | | | |
| Sorghum | 4.4 | 6.4 | 7.3 | 7.9 | 8.6 | 9.2 | 9.9 | 10.5 | 11.0 | 11.5 | 12.0 | 13.0 | 14.2 | 15.2 | 15.8 | | 18.8 | 20.3 | 21.9 |
| Soybean | 3.8 | 4.3 | 5.5 | 5.9 | 6.5 | 6.8 | 7.1 | 7.4 | 8.0 | 8.6 | 9.3 | 10.5 | 11.5 | 13.1 | 14.8 | 16.4 | 18.8 | | |
| Spinach | 4.6 | 5.5 | 6.5 | 7.1 | 7.8 | 8.3 | 8.9 | 9.5 | 10.0 | 10.6 | 11.1 | 11.8 | 12.4 | 13.2 | 14.5 | | | | |
| Squash, Winter | 3.0 | 3.6 | 4.3 | 4.9 | 5.6 | 6.2 | 6.8 | 7.4 | 7.9 | 8.4 | 9.0 | 9.6 | 10.2 | 10.8 | | | | | 22.5 |
| Sugar beet | 4.4 | 5.3 | 6.3 | 7.1 | 8.0 | 8.9 | 9.4 | 10.2 | 10.7 | 11.3 | 12.0 | 13.0 | 13.3 | 14.5 | 16.6 | 18.6 | 20.5 | | |
| Sunflower | | | | | 5.1 | 5.6 | 6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.7 | 9.3 | 10.0 | 11.5 | 13.5 | 15.0 | | |
| Tomato | 3.2 | 4.1 | 5.0 | 5.6 | 6.3 | 6.9 | 7.5 | 7.8 | 8.3 | 8.7 | 9.2 | 10.1 | | 11.1 | 12.0 | | | | |
| Turnip | 2.6 | 3.3 | 4.0 | 4.6 | 5.1 | 5.5 | 5.9 | 6.3 | 6.7 | 7.0 | 7.4 | 7.9 | 8.5 | 9.0 | 10.0 | | | | |
| Watermelon | 3.0 | 3.5 | 4.8 | 4.5 | 6.1 | 5.6 | 5.9 | 7.6 | 6.7 | 7.1 | 8.8 | 7.9 | 8.4 | 10.4 | 11.0 | | | | |
| Wheat | 5.5 | 6.5 | 7.0 | 8.0 | 8.5 | 9.2 | 9.9 | 10.4 | 11.1 | 11.6 | 12.1 | 12.9 | 13.7 | 14.6 | 15.9 | 19.2 | 19.8 | 23.0 | 26.6 |
| Wheat, Durum | | 6.6 | 7.2 | 7.8 | 8.5 | 9.1 | 9.5 | 10.0 | 10.5 | 11.0 | 11.5 | 12.4 | 13.2 | 14.1 | 15.4 | 18.0 | 19.3 | 22.9 | |
| Wheat, Hard Red Spring | | 6.8 | 7.3 | 7.9 | 8.5 | 9.0 | 9.5 | 10.1 | 10.7 | 11.2 | 11.8 | 12.8 | 13.8 | 14.8 | 16.6 | 17.9 | 19.7 | 22.3 | 26.3 |
| Wheat, White | | 6.7 | 7.3 | 7.9 | 8.6 | 9.0 | 9.4 | 9.9 | 10.5 | 11.2 | 11.8 | 12.9 | 13.9 | 15.0 | 16.1 | 18.5 | 19.7 | 23.0 | 25.0 |
| Wheat, Winter Hard Red | | 6.4 | 7.1 | 7.8 | 8.5 | 9.3 | 9.9 | 10.5 | 11.1 | 11.8 | 12.5 | 13.1 | 13.8 | 14.6 | 16.1 | 17.9 | 19.7 | 22.3 | 25.6 |
| Wheat, Winter Soft Red | | 6.3 | 7.0 | 7.7 | 8.6 | 9.3 | 9.9 | 10.6 | 11.0 | 11.4 | 11.9 | 12.8 | 13.8 | 14.6 | 16.1 | 17.9 | 19.7 | 22.6 | |
| A.V. (gr moist / kg air) | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 | 11.0 | 12.0 | 13.0 | 14.0 | 15.0 | 16.0 | 17.0 | 18.0 | 19.0 | 20.0 |
| R.V. at T=25°C (77°F) | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |

Agratechniek b.v.
Lou Nieuwenhuizen
DRYING INSTALLATIONS & EQUIPMENT

# Open drawer dryer

**Drying – ventilation units for drawers**

Drawers with gauze bottom

Easy placing drawer in the dryer

Air-inlet and air guidance per drawer

Air in- and outlet per drawer individually

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DRYING INSTALLATIONS & EQUIPMENT

# Open drawer dryer

Easy handling

Air-inlet opens when drawer is being placed

Fan for extracting conditioned air to blow through the seed

Extracting unit including heater and valves

Fan with 5 speed or 0-100% controller

Controlling of heating by modulating thermostat and fan-speed control

# Conditioned tray dryer

In plant breeding, but also flowers seeds, the seed volumes are relatively small. However, these delicate and precious seeds must be treated very carefully. In this conditioned drying installation, small quantities of seeds are dried in trays, under the correct air conditions. The installation can be assembled to your needs and specifications.

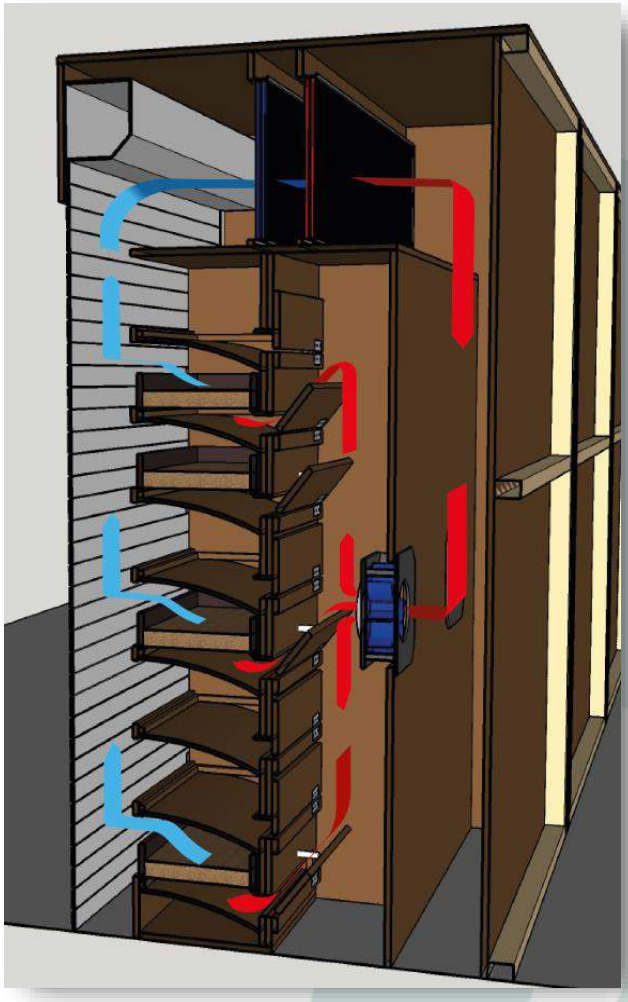
The conditioned drawer or tray dryer is a closed installation. With this installation the seed is dried at the desired air temperature to the desired moisture content. This by using dried and cooled air. The trays or drawers are placed in an air distribution system. Which ensures that the air is blown or sucked through the seed. The air distribution system is located in a closed casing so that the seed can be dried regardless of the outside conditions.

This dryer can be made suitable for drawers or trays of different sizes. This size can depend on the amount of seed, the moisture content and the desired drying speed.

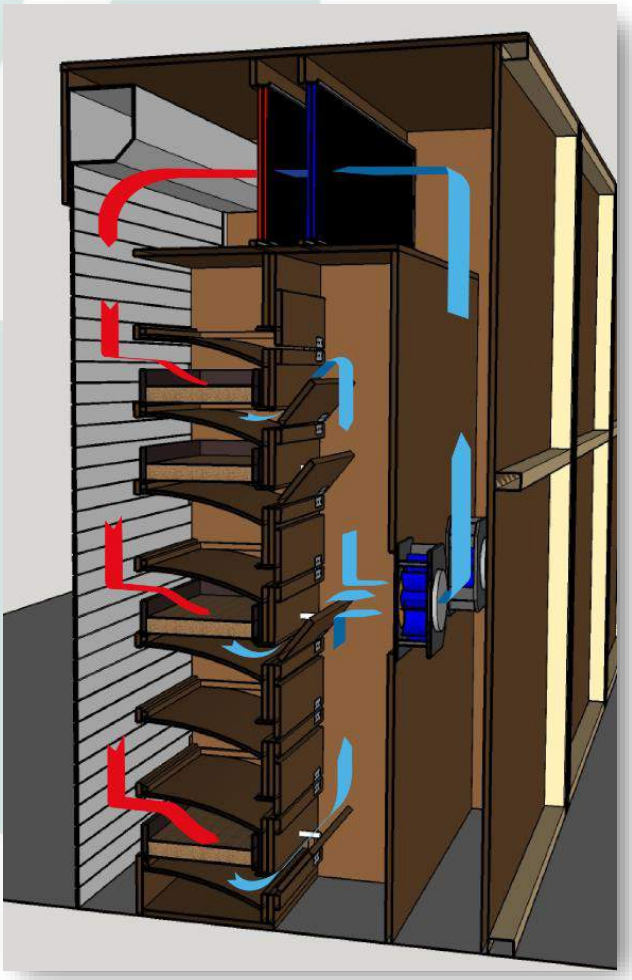
The tray dryer is assembled according to your wishes; the number of sections and the number of trays per section.

# Conditioned tray dryer

The air can either be blown or sucked through the seed. The choice depends on the specific weight and the amount of seed. With a suction system, the light seed will always remain in the tray and will not be blown away. Dried air is added per section. This air is cooled or heated to the desired temperature.



On the left a blowing system: In this version the air is being sucked in at the rear. And is then blown through the seed from bottom to top via a lockable opening. The air is sucked back to the rear through the top.

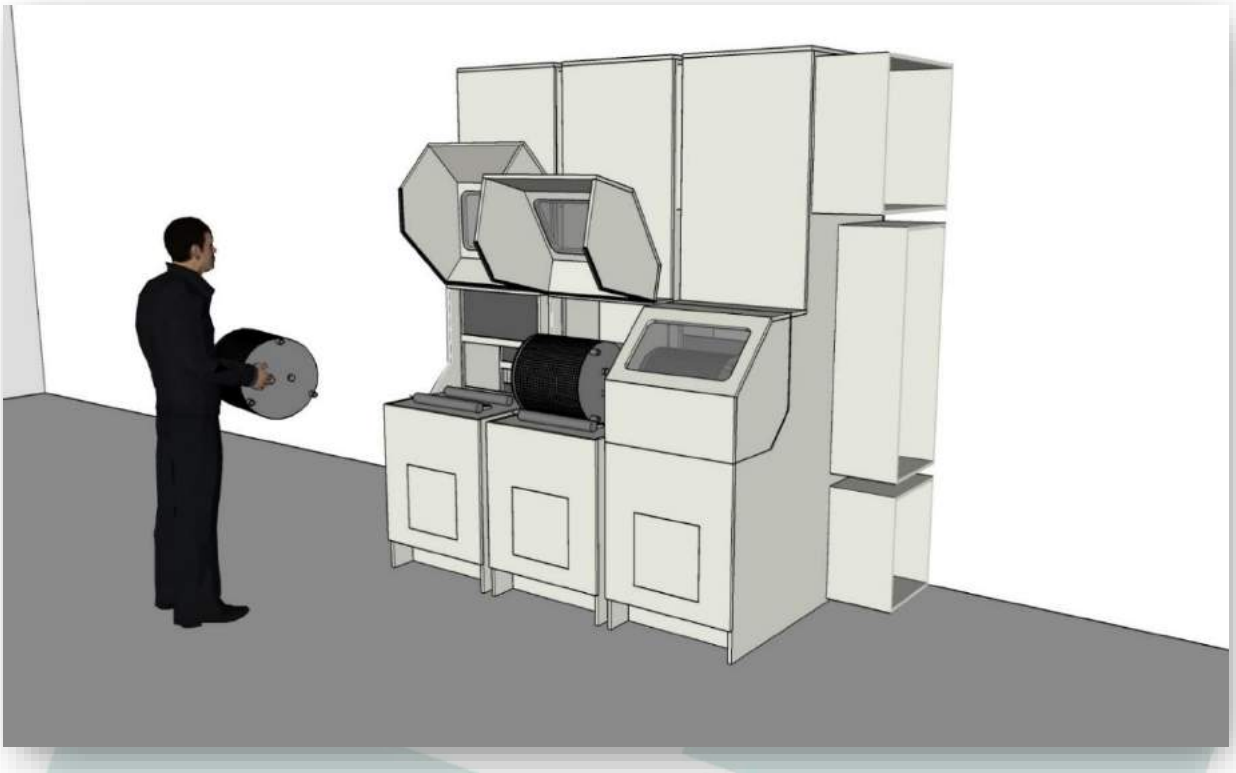


On the right a suction system: In this version the air is sucked through the seed from top to bottom through each tray or drawer. The air is then lifted upwards at the rear and sucked in again at the front through the top.

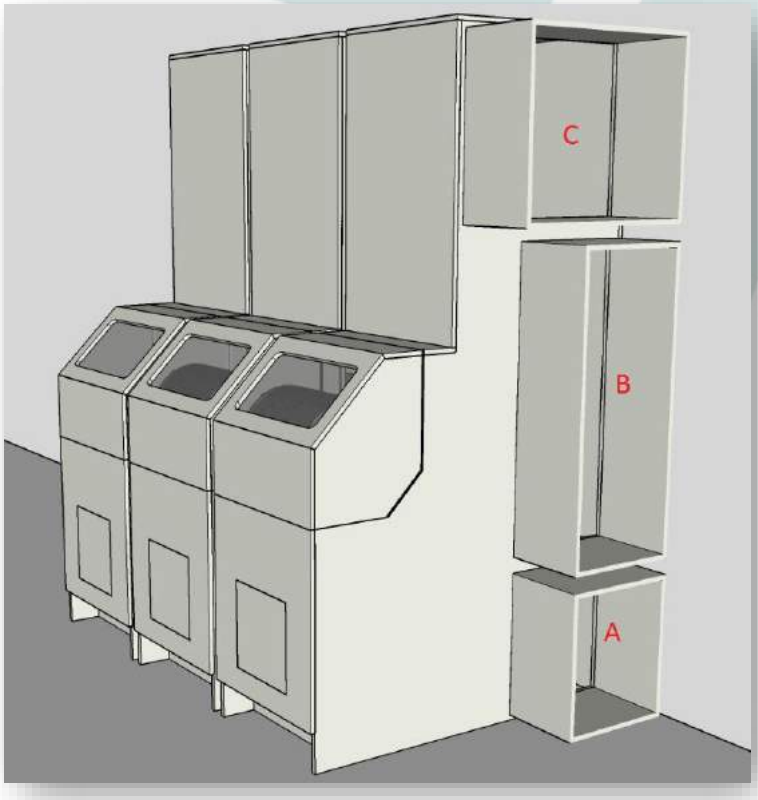
The air is brought to the desired moisture content and temperature at the top of the installation. This ensures that the seed is always dried at the desired air condition. The design of the air treatment installation depends on the required air circulation, the amount of moisture to be drained and the temperature at which there should be dried.

# Individual drum dryer

Drying of seed per drum individually is possible. The seed in a drum will automatically being dried to the desired equilibrium moisture content.



Per drum dryer setting of quantity-, temperature and Absolute Humidity (AH) of process air.




C: central airduct for outlet damp air

- When air from the drum is more damp than outside, this will be dispatched.

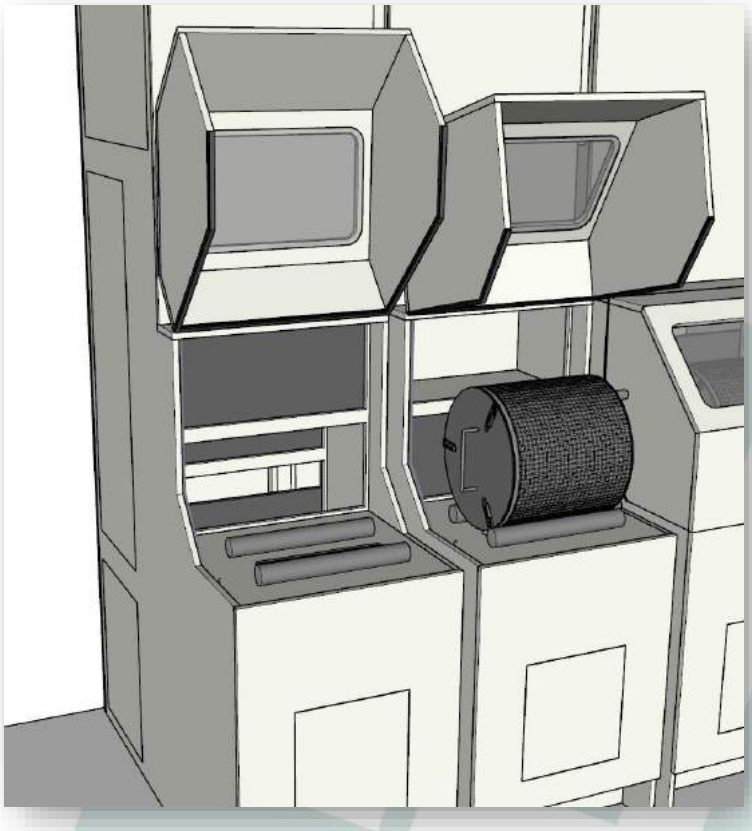
B: central airduct for inlet outside air

- Starting with heated outside air a large quantity of water is drained.
- When required, dehumidified air will be added to a drum-unit to continue optimal drying.

A: Central inlet for dehumidified air

- Dehumidified air will enter a drum dryer when drier air is required.
- When air out of the drum is drier than outside, this will be recirculated.
- Drying continues with dehydrated air.

# Individual drum dryer



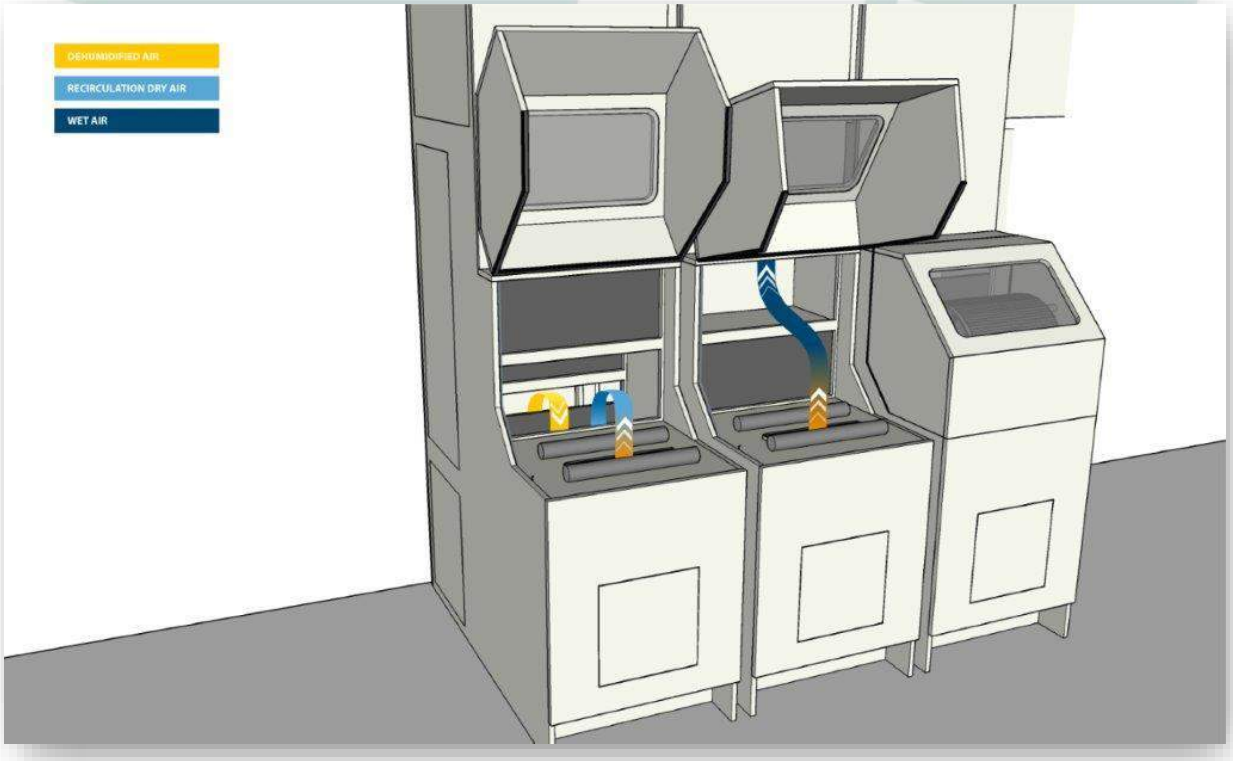
Slide inside for extracting outside or recycled air. Optional with dehumidified air.

Outside air is warmed up to the desired temperature to absorb moisture. Outside air and dehumidified air can be mixed to decrease AH and increase drying capacity.

When air out of the drum is more damp than outside, it will be dispatched outside (middle).

When air from the drum is drier than outside, this is recirculated and mixed with dehumidified air (left).

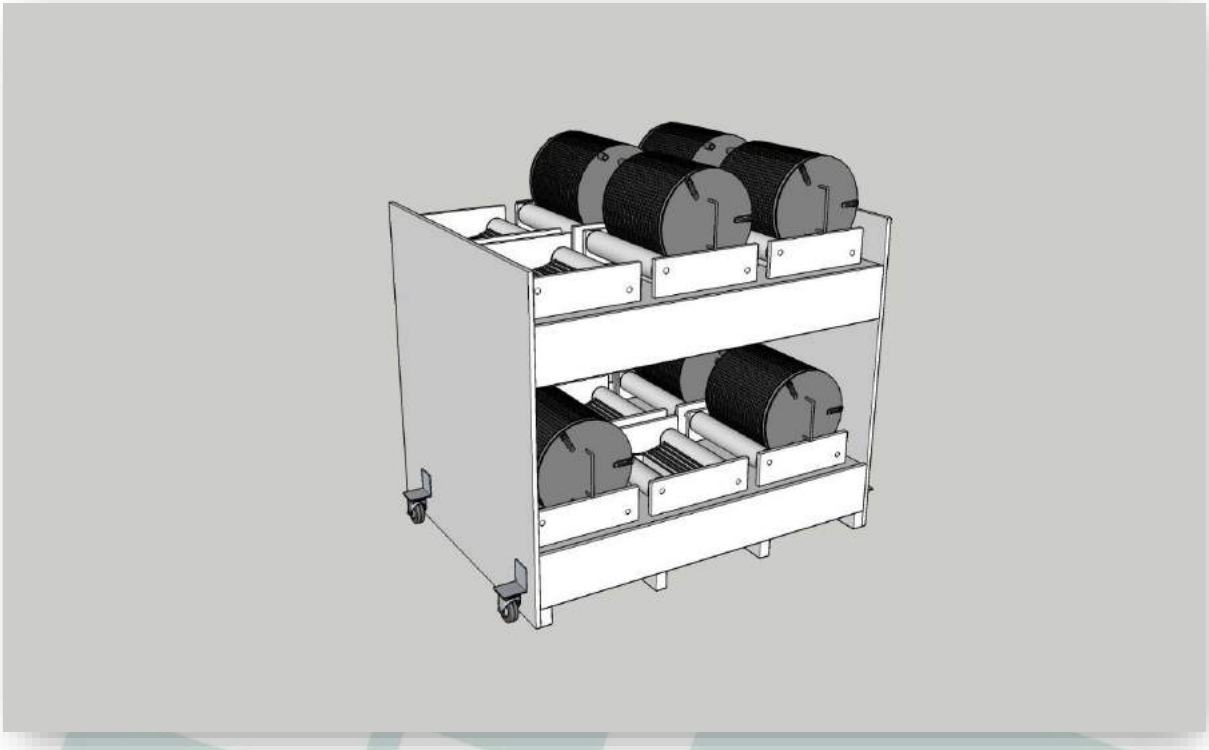
Final moisture from the product will be drained by dehumidified air.



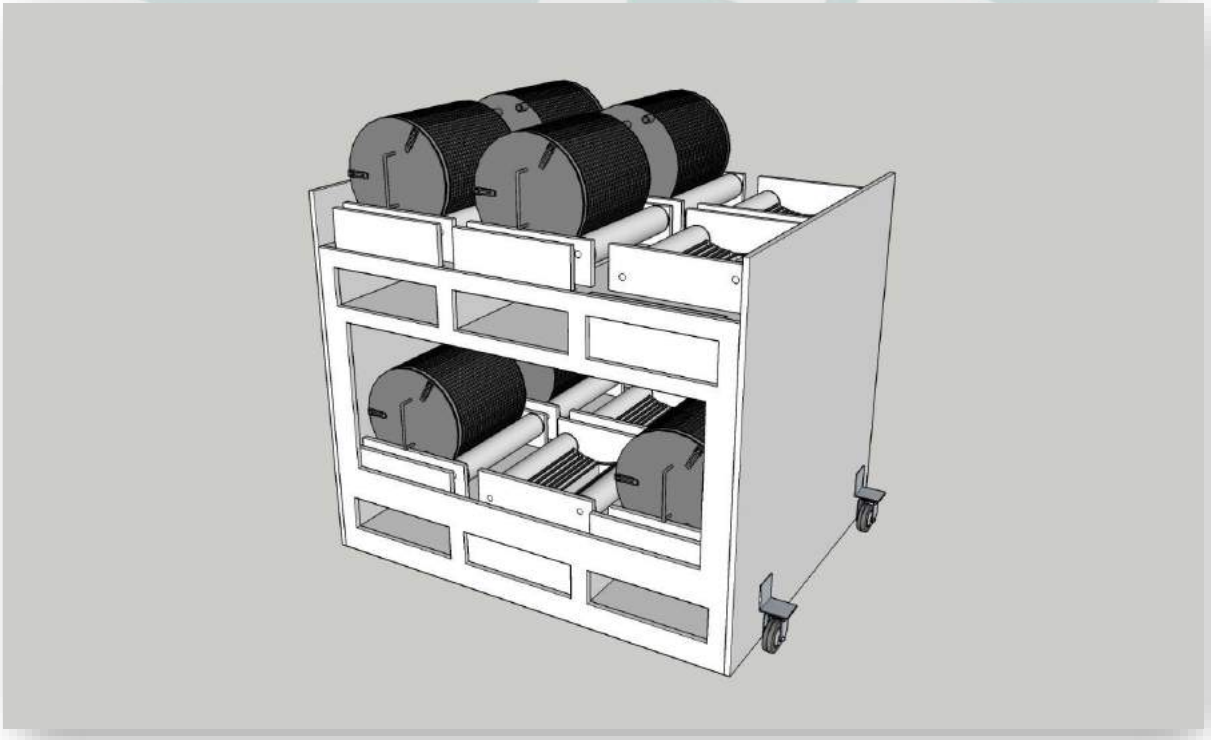

Valve for dispatching wet air to outside (middle) and valve to recirculate dry air (left). In the back a valve to bring dehumidified air to mix with outside air or recirculated air when required.

# Drum ventilation unit

Basic ventilation unit for drum dryer installations.



Standard 2x 6 drums, other capacities on demand.
Per level a roll drive with motor. The unit is easy to transport by rolls or by forklift.

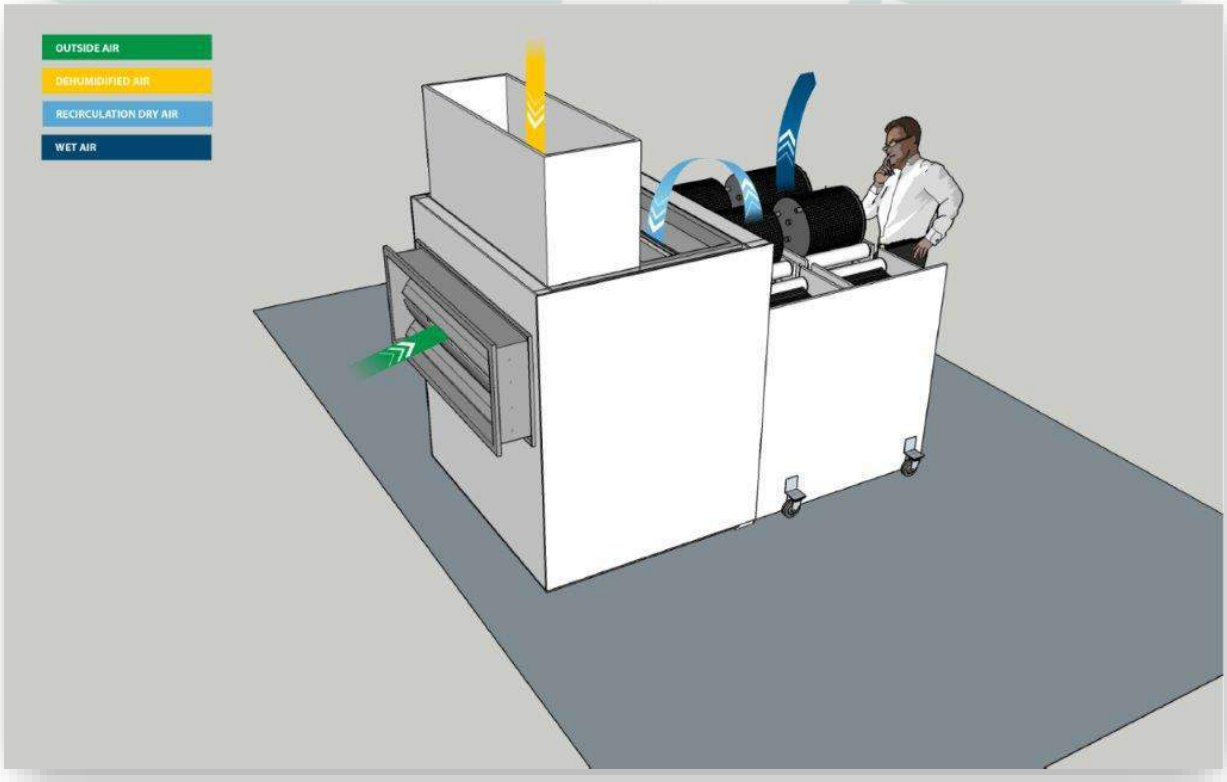


2x 3 inlets for 2 drums each. Each inlet has a slide for closing.

# Open drum dryer installation

Flexible drying of seed in every processing area.

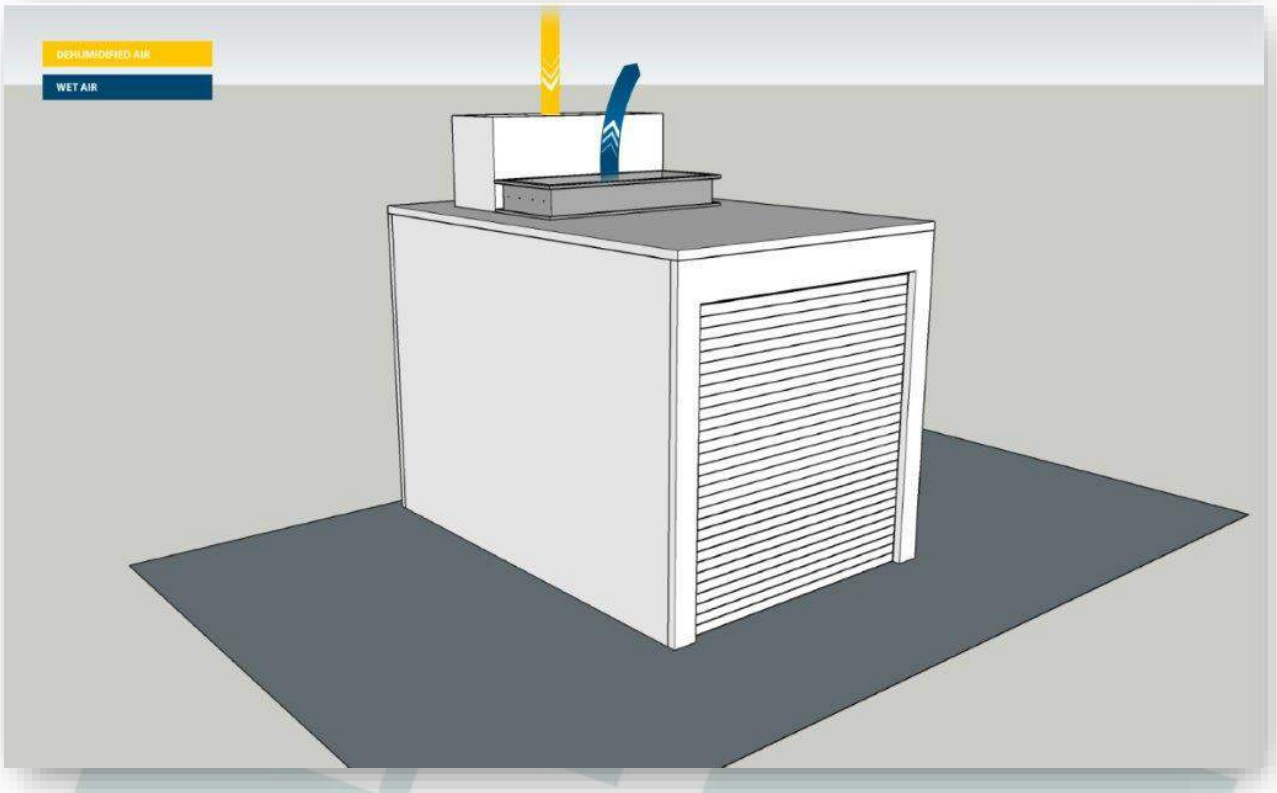
Ventilation unit with open drum dryer installation. Easy to place in every room or processing area.



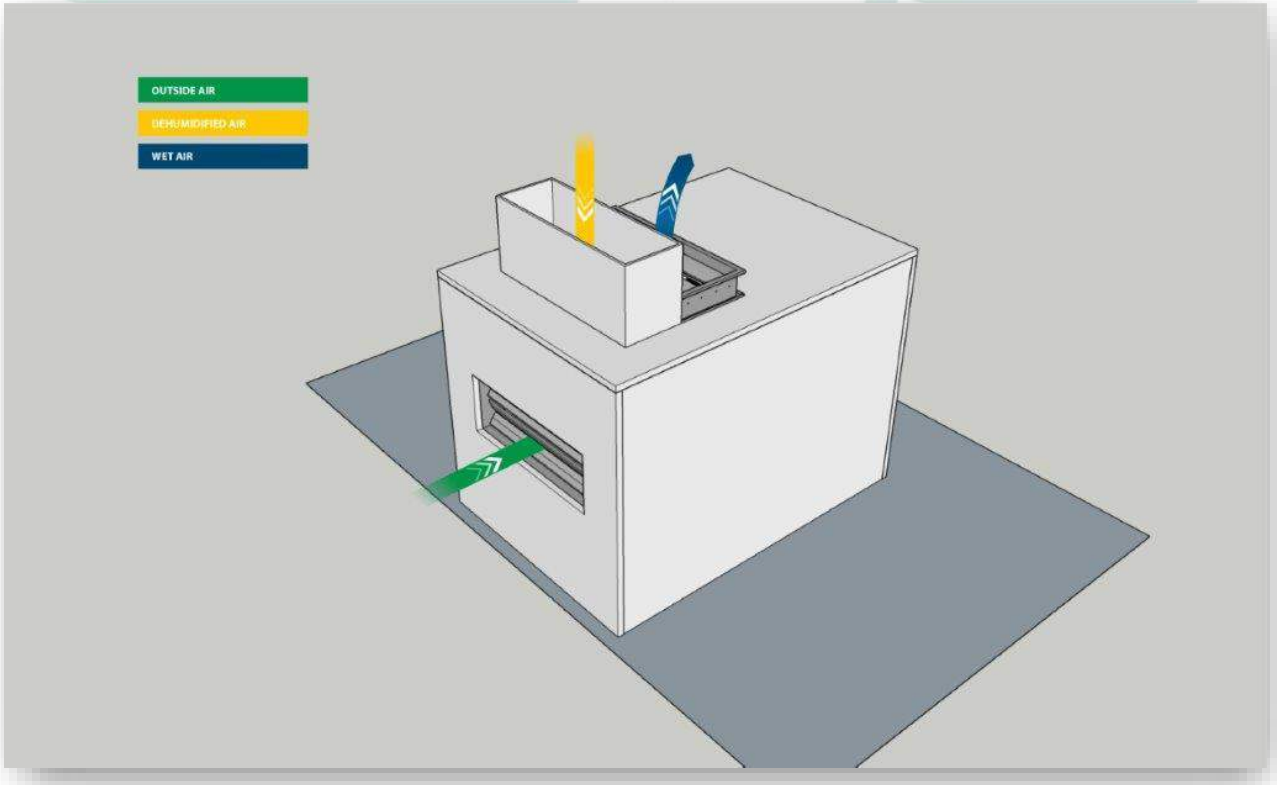

Airflow by the dryer: Inlet outside air inlet dehumidified air recirculated air wet air

# Closed drum dryer installation

Drying of seed in a conditioned room with drums.

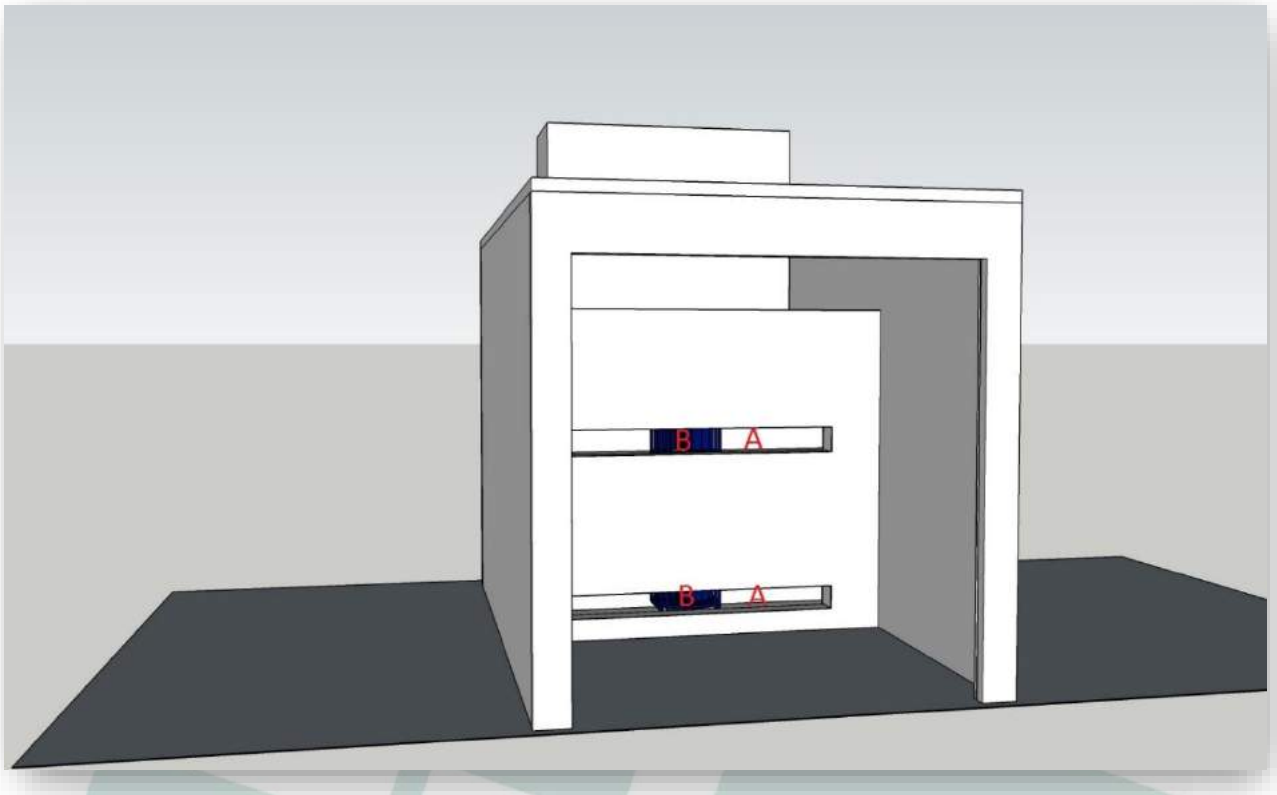



Closed room with drum dryer installation inside. Entrance to the room by a roller shutter.

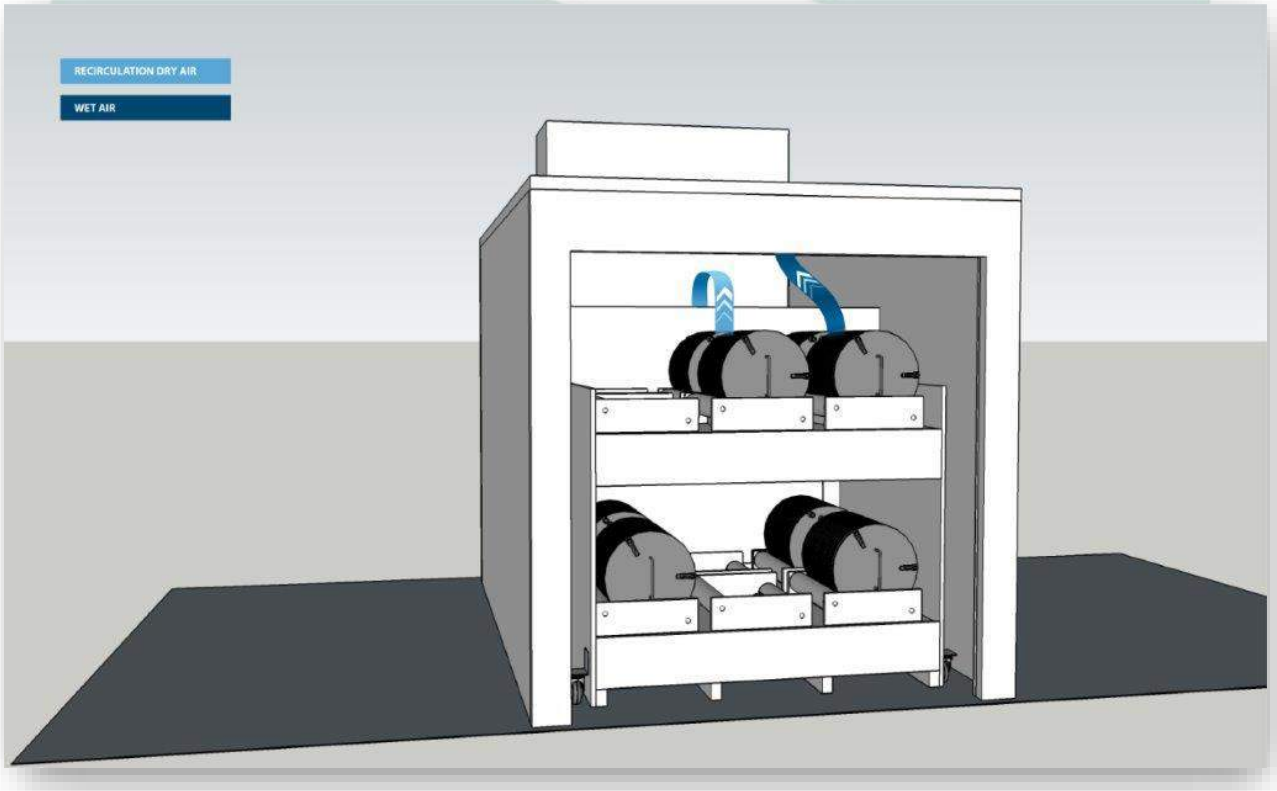



Airflow per room: Inlet outside air inlet dehumidified air outlet wet air

# Closed drum dryer installation




Per drum-level an outlet (A) and per outlet a high pressure fan (B).




When air from the drum is more damp than outside, this will be dispatched. When air from the drum is drier than outside, this is recirculated and mixed with dehumidified air.

# Mobile drum dryer

The mobile drum dryers are portable when using wheels or a forklift. The dryers are made for 2-4-6 or 8 drums.

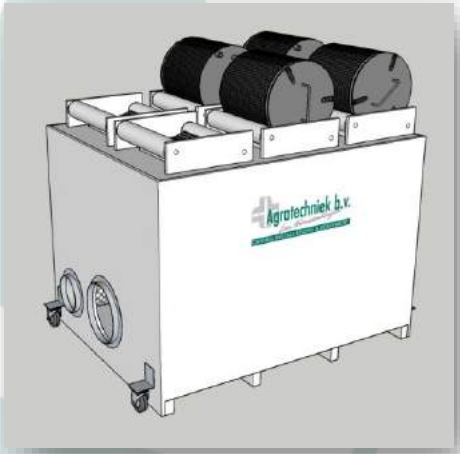
Every drum position is equipped with its own fan. Therefore the air quantity can be adjusted per drum.

The temperature can be configurated individually per rows of 2 drums.

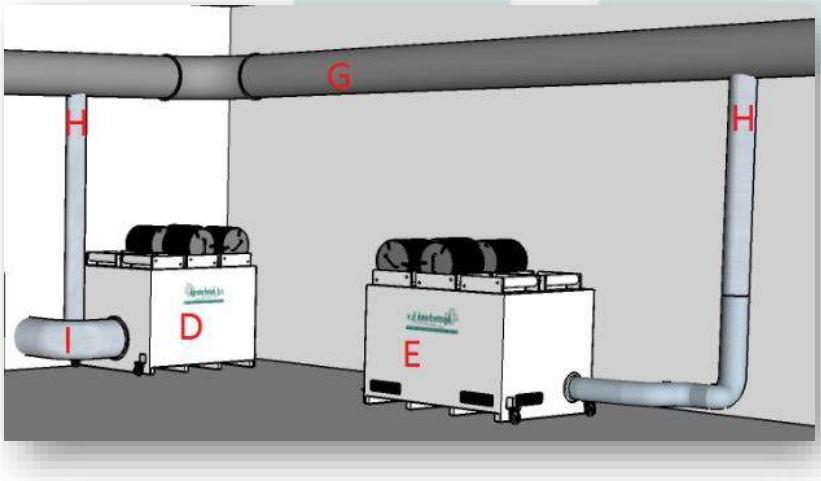
In this version the air enter the drying space through the drums. The drum dryer can be equipped with a closed cap, so the air from the drums can be discharged.

Above you see a version in which the air is suctioned from the space. There is also an inlet (bottom left), which can be connected to a central dry-air installation

At the right a mobile drum dryer with an external air connection.



Below you see mobile drum dryers connected to the supply pipe containing dried air from the central air dryer.




D Dryer with outside air suction.

E Dryer with space air suction.

G Central supply pipe for dried air

H Dried air supply to the dryer

I Supply of outside air

Thanks to the central air dryer installation, you will have a highly flexible drying process and you can utilize the dried air economically; the drying process begins with heated up air. Only when dried air is necessary during the phase of the installation, it will be supplied.

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DRYING INSTALLATIONS & EQUIPMENT

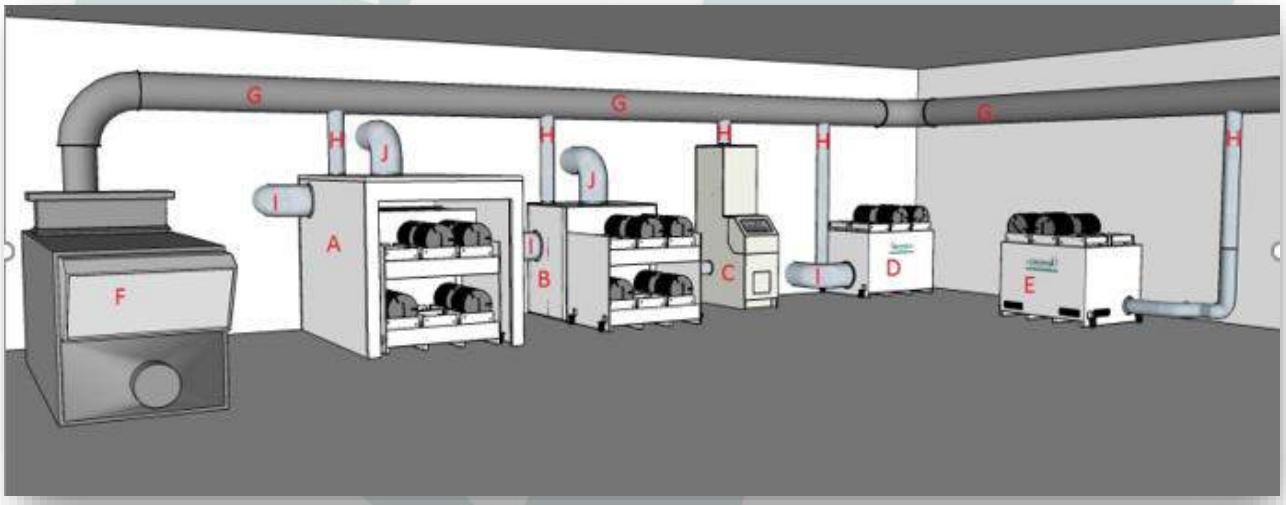
# Central dried air

## for drum dryers and other installations

The air drying process is an expensive business; this applies not only to condensation and adsorption dryers, but also to the hybrid dryers of energetic interest (combined condensation and adsorption drying). It is not economical to place an air dryer at every drying installation. Continuous drying does not take place at all installations, and dried air is not required constantly.

**On the right:** Central hybrid air dryer

Agratechniek has developed a principle at which a **central air dryer (F)** brings the dried air to where it is needed. Various drying installations, like a closed drum dryer **(A)**, open drum dryer **(B)**, individual drum dryer **(C)**, mobile drum dryer with outside air **(D)** and mobile drum dryer with inside air **(E)** are connected to a central air duct **(G)**. Thanks to the advanced ABC process the dried air is discharged automatically to where it is needed at that moment.




During the seed drying process, a lot of moisture can be discharged using heated up outside air. Unfortunately the conditions of the outside air are not always suitable to reach the desired equilibrium moisture content at the end. Especially now that more seed companies want to receive, store and package the seed with a lower moisture content. To be able to dry the seed quickly and successfully, dried air is needed in the last phase.

It is therefore not necessary to have each drum dryer provided with an air dryer!

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DRYING INSTALLATIONS & EQUIPMENT

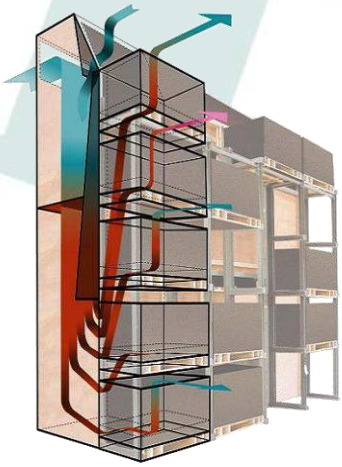
# Individual box dryer

Drying each box individually to the desired moisture content of the seed.

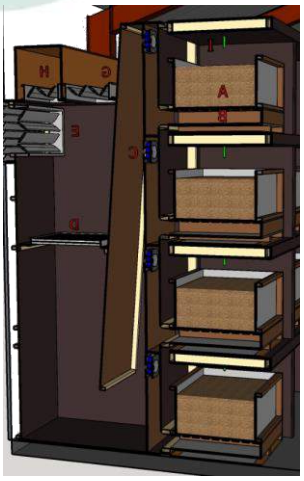
Example installation without boxes

Installation partly filled with boxes

Boxes placed in scaffolding in front of drying installation. Box can be placed or taken one's ready.



Extracted air heated and or dehydrated passes through each box individually.



Drying of an individually box starts when placed in scaffolding and stops automatically when the seed is dry.

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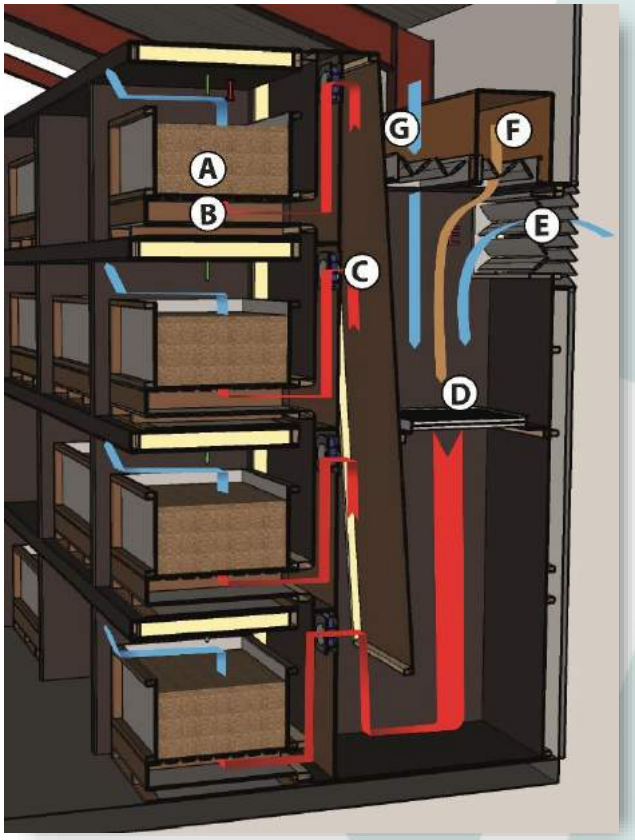
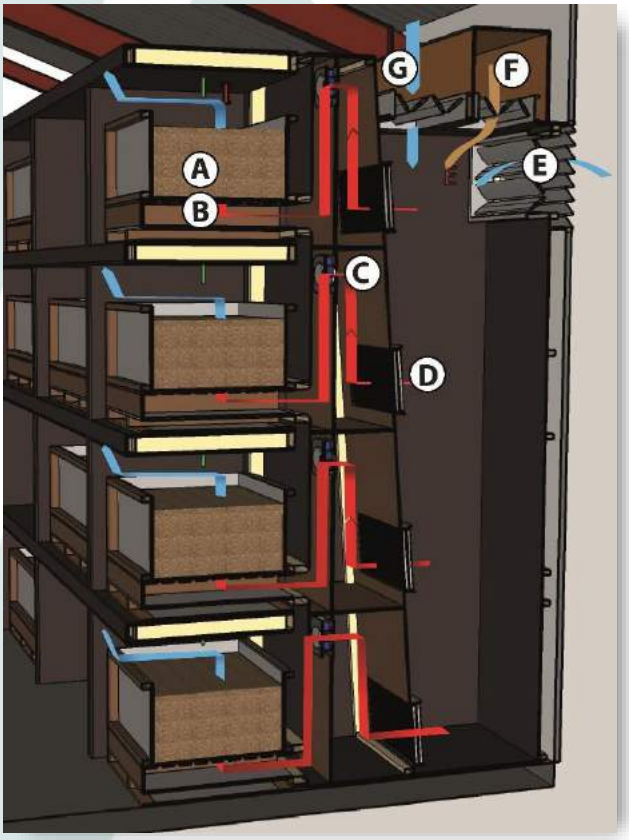
# Individual box dryer

Measuring air out of seed per box to control.

LED-lamps for indication status of drying.




Example individual box drying with dehydrated air.




Extra option: temperature per box individually

A. Box with seed
B. Inlet pallet
C. High pressure fan per box
D. Radiator heater with warm water
E. Valve for inlet outside air
F. Air-duct and hatch for inlet dehydrated air
G. Valve for inlet inside air (recycling).

**Process:**
The box is being placed, the fan will start automatically. The fan will speed up till the desired airflow as set for this box has been reached. The drying starts by extracting outside air. When seed starts to dry and outside air is not dry enough, dehydrated air will automatically mix with the outside air till the desired AH as programmed. When air out of the seed becomes dryer than outside air, automatically dry inside air will be extracted.
The drying will continue till the air out of the seed has reached the AH as goes with the equilibrium moist content of the seed. At that moment, the slide will slowly close. When closed the seed in this box is dry.

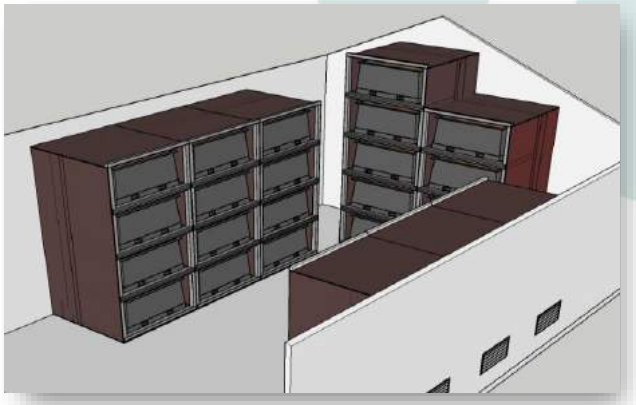
# Efficient and economical drying

When you are looking for ways to use your industrial spaces as efficiently as possible, it is often a good option to save space in drying installations. Furthermore, it is important to dry the seeds in every box well using sufficient air. And it is probable you would want to keep using the existing drying boxes.

Agratechniek has the possibility to meet all these needs;

- The boxes can be placed 3-4-5 stacked on top of each other in a drying installation.
- Below every box there would be a plenum, which blows air through the box with the help of 1 or 2 small high-pressure fans. This ensures sufficient air is blown through every box.
- The drying installation is manufactured to client specifications, i.e. adjusted to the measurements of your own boxes. And you can continue to use your own boxes.


In an existing or new hall, the height can be maximized with the individual drying installation. The height of the box quantity can be adjusted per row.



In a building with a surface of ca. 10x10 m and 6 m high, this option would make it possible to dry 40 boxes individually. The boxes are placed on top of each other in stacks of 5, and there is enough space for a forklift; 80% better use of your industrial space.

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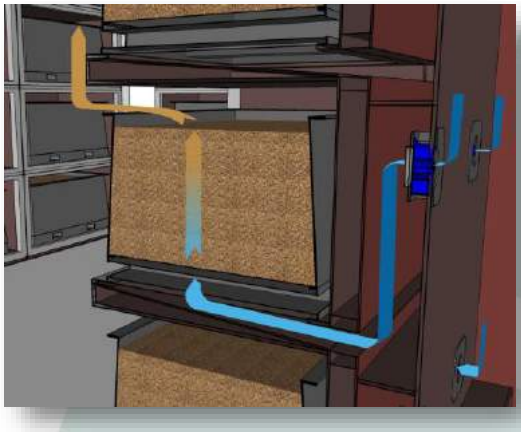
Lou Nieuwenhuizen
DRYING INSTALLATIONS & EQUIPMENT

# Efficient and economical drying

With another set-up and a sidewall of 5 meters high, it is possible to dry at least 160 boxes at the same time, in a space of ca. 30 x 13.50 meters.

At the sidewall, the dry air is suctioned from the rear side. When there is a central set-up, the air is suctioned through a central shaft from the headwall.



Every box is equipped with 2 high-pressure radial fans. Thanks to the great efficiency of these fans, 30 boxes can be dried at the same time with 10 kW power. The air quantity would then be 60,000 m³/h at 300 Pa.

The air flows more difficult through a full box than through a half-full box. The same can be said for a humid box and a box with fine seeds. This can have large consequences for a standard drying installation with 1 fan. Almost no air will flow through a full box with moist and fine seeds, when it is lined up with boxes full of dryer and/or coarser seeds. And this is especially the case when there are half-full boxes in between those boxes.
As every box in this particular drying installation has its own fans, every box will be dryed individually and effortlessly. Other boxes no longer have any impact. Every box can be installed when desirable at that moment.

The installation will be customized to your desires. We take into account the size of your boxes and the available height, the routing within your company and possible expansion in the future.

When the drying process takes place with `double boxes' (dryer and humid), the installation will be adjusted as needed. Boxes will be restacked more efficiently as the top drying box can be placed directly into the empty place below or above.

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# Conditioned box dryer

With the conditioned box drying installation the seed in the boxes can be dried to the desired moisture content. This can be freshly harvested seed, or seed that needs to be brought to a lower moisture content before shipping. With this conditioned drying installation, a small number of boxes can be dried individually. The installation can be manufactured according to your wishes and according to your specifications.

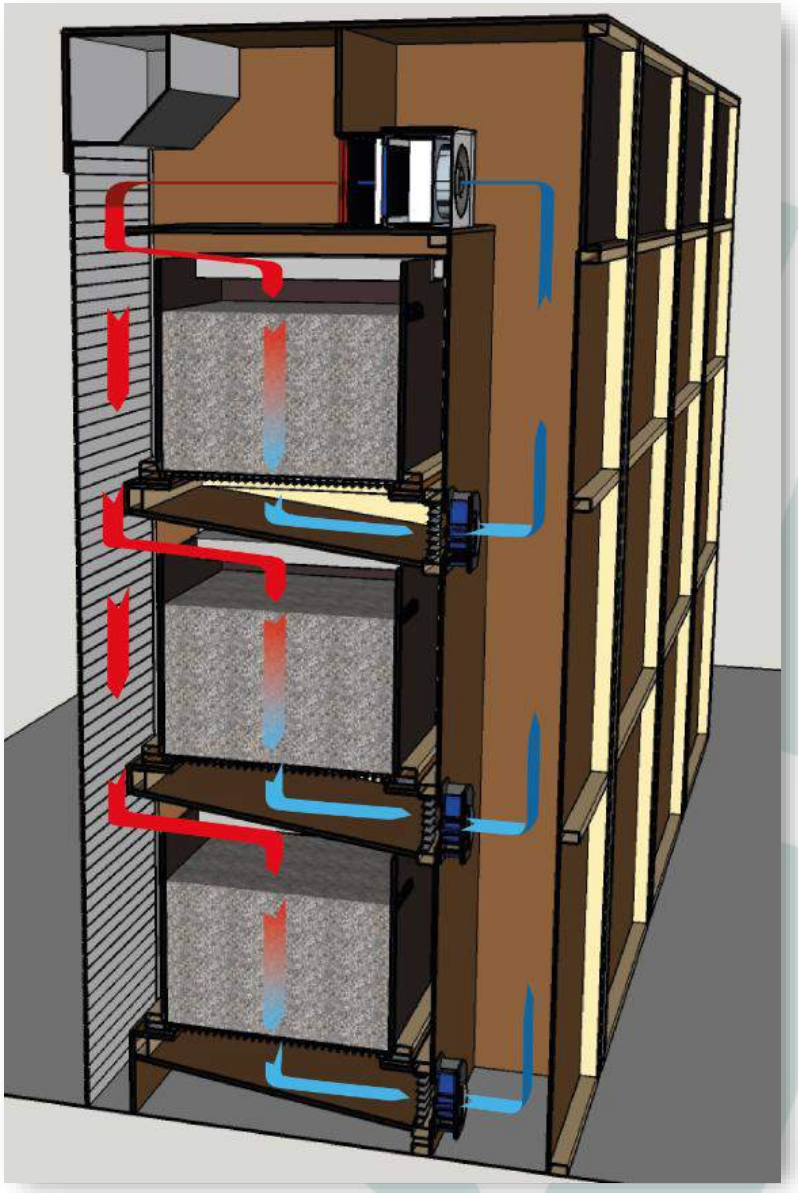
The conditioned box dryer is a closed installation with which the seed is dried to the desired moisture content at the desired air condition. This by using dried and cooled air. The boxes are placed separatedly from each other in an air distribution system. Which ensures that the air is sucked through the seed. The air distribution system is located in a closed casing so that the seed can be dried regardless of the outside conditions.

The box dryer is adapted to the size and design of the drying boxes. The box dryer is assembled according to your wishes; the number of sections and the number of boxes per section.

Dried air is added per section. This air is cooled or heated to the desired temperature. The equipment installed for this purpose is selected on the basis of the amount of seed, the moisture content and the desired drying speed.

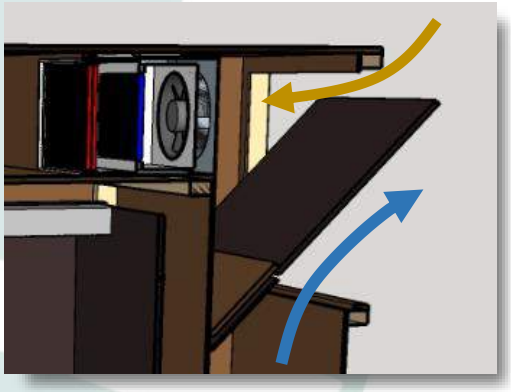
# Conditioned box dryer

At the top, the air is brought to the desired moisture content and temperature. This ensures that the seed is always dried at the desired air conditions. The design of the air treatment installation depends on the required air circulation, the amount of moisture that must be removed and the temperature at which the drying needs to take place.



A high-pressure fan has been installed for each box. The air volume can thus be configured per box to match the quantity and type of the seed.

With the conditioned box dryer the air is sucked through the seed from the top to the bottom. The air is blown upwards at the rear and sucked in through the top at the front.



The picture above shows an option to remove humid air to the outside and to draw in drier (outside) air. In the case of moist seed, the drying time is thus greatly reduced. When the air from the seed becomes drier than the outside air, this air will automatically be used in the drying process.

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# Fluid drying in boxes

**Drying soaked seeds and pellets fluid in boxes**

Drying installation for fluid drying of batches (soaked) seed and pellets in special drying boxes. The installation consist of dryingsections and a central hybrid air-dryer by condensation and adsorption.

The box will be placed into the drying section. Each box place is provided with a fan. Dry air will be pushed through every individual box to make the product fluid and to dry homogeneous.

The outlet for each box place has a T°+HR sensor to measure outcoming moist content. When this air is damp, it will be blown to outside. When this air is dry, it will be recycled.


High-pressure fan with flow sensor for each box place.

Outlet with T°+HR sensor to control the process.

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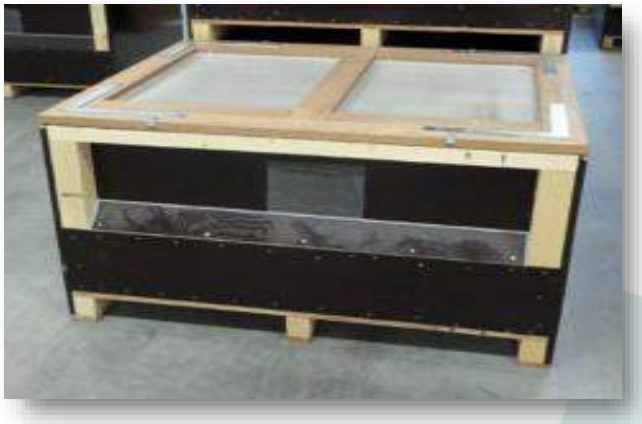
# Fluid drying in boxes



Box for wet seed is provided with cover to avoid blowing out of the seed.

Wet seed, completely fluid.

Seed pellets (up to 4 milion per box) drying like little volcano's; fast but with care.

Loose seed spread over the pellets to illustrate the volcano's.

As an option each box place will be provided with a hot water radiator. Per phase the desired T° can be programmed individually; drying can start with high temperature because of all the moisture to be dehydrated.

Process to be programmed and controlled by a control panel with touchscreen and ABC software.

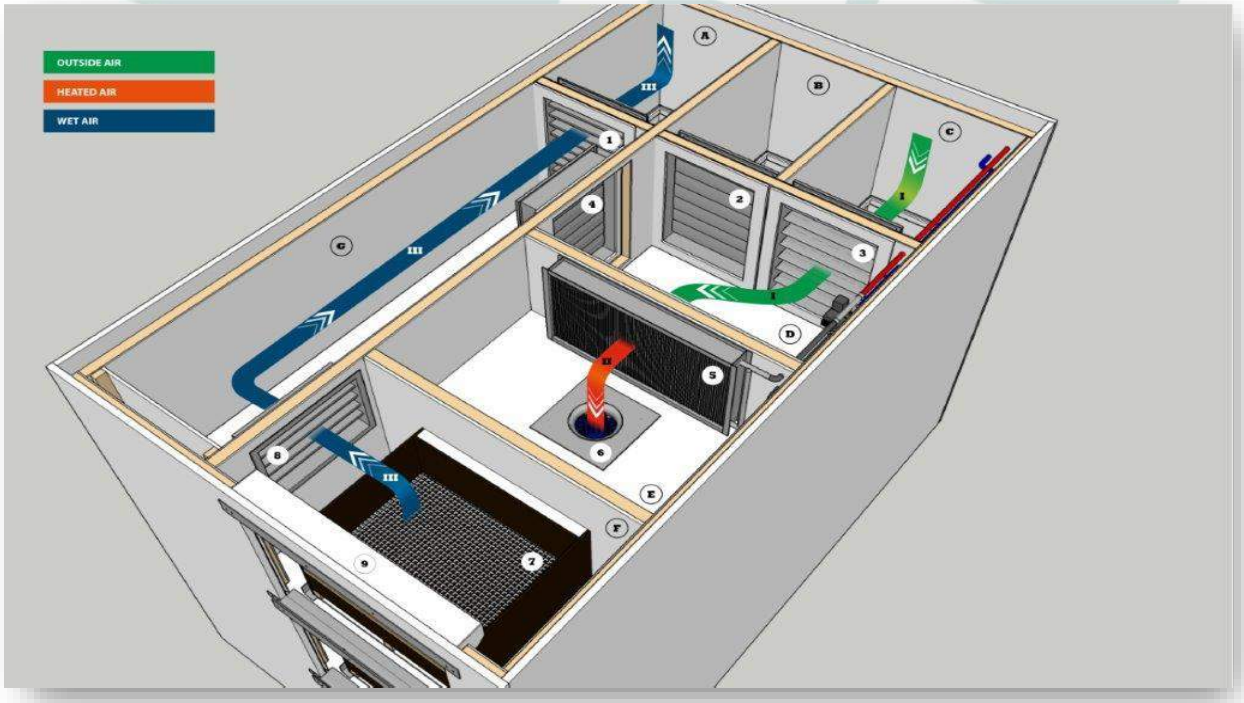
LED-lamps per box place for direct indication of the phase (blue last phase, white drying is ready).

# Intensive or fluid drying in boxes

Seed pellets or soaked seeds are dried per box individually

Example of installation for drying of 100.000.000 seed pellets per hour.

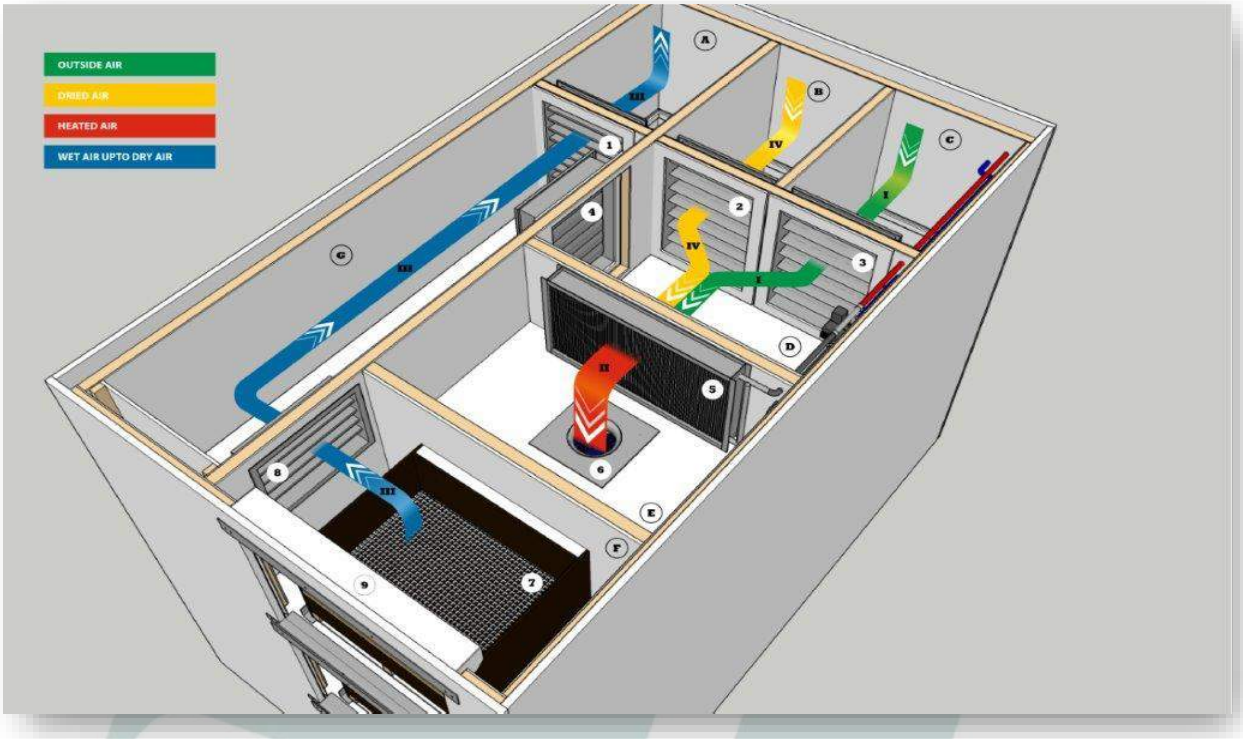
The product is dried in phases according to a set menu for each individual box. The desired quantity, temperature and moisture content of the air programmed per phase. Per box the desired moisture content of the product will be reached.




Start drying with 100% outside air. The air will be heated and squeezed through the product. The warm air adsorbs moisture and is dispatched to outside.

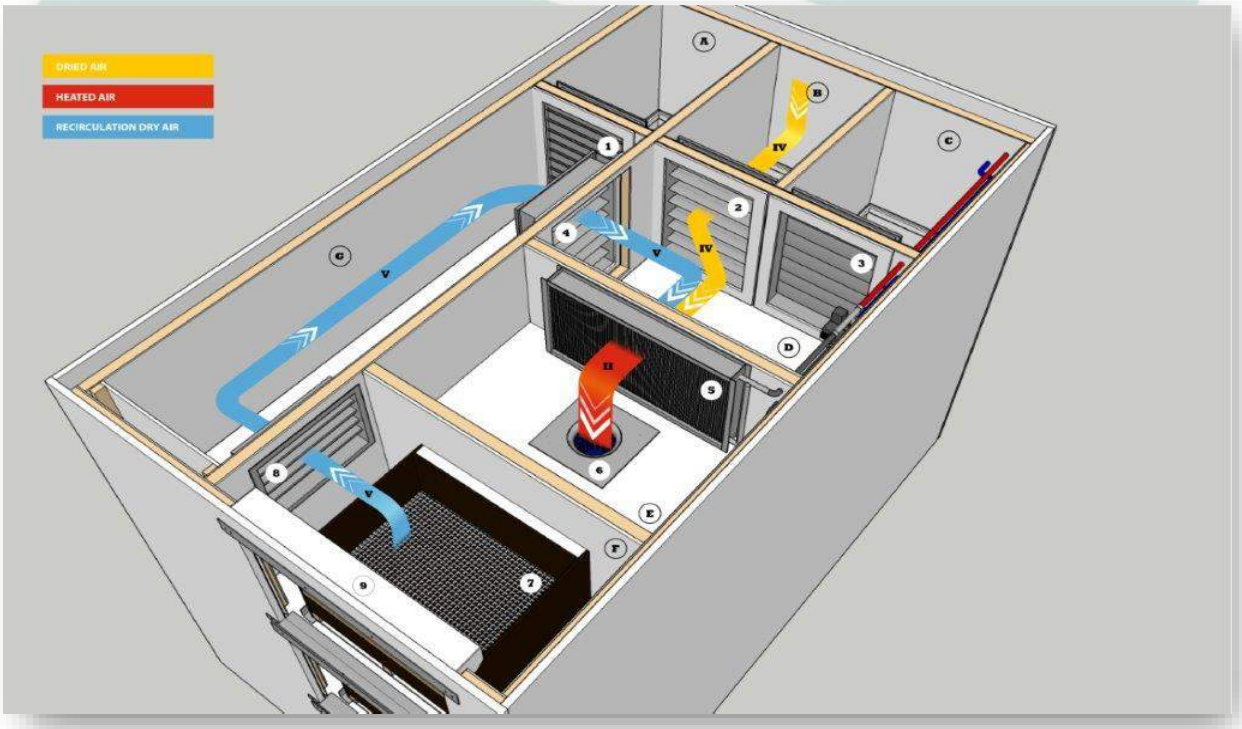
Airflow per box: Inlet outside air Heated air wet air

# Intensive or fluid drying in boxes




While the product dries, dehumidified air will be added.
That's why the desired moisture content can always be reached.

Airflow per box: Inlet outside air inlet dehumidified air Heated air wet air




When the air from the product is drier than the outside air, this dry air is recirculated.
The last moisture from the product will be adsorbed by the dehumidified air.

Airflow per box: inlet dehumidified air Heated air recirculated air

# Box drying installations bulk

Efficient drying of seed in boxes with processors for automatically drying to the desired moist content level. Stacking 3 to 7 boxes high. Using height gives maximum drying volume on minimum floor space; more drying capacity.

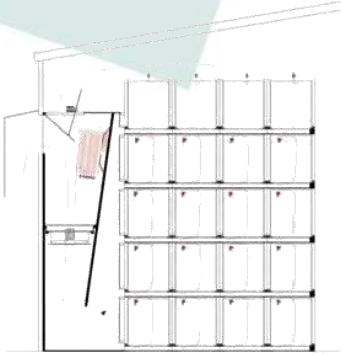
The openings in front of the air distribution system are on position of each box pallet. Extraction outdoor air from the back by an opening in the wall. Recycling indoor air when outdoor is too damp.

Pallet bottom closed by 9mm plywood.

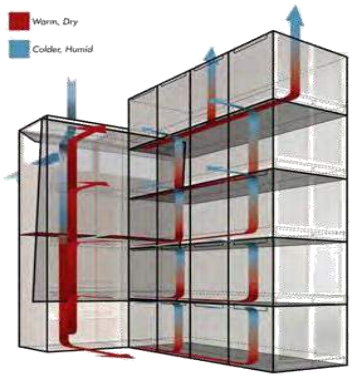
Difference in thickness between plywood and hardwood plank.

Difference makes openings between box layers for escaping moisture on each layer.

Boxes are place in front and on top of each other.



A fan extracts outdoor or indoor air. Air will be heated or dried and distributed over the box levels.



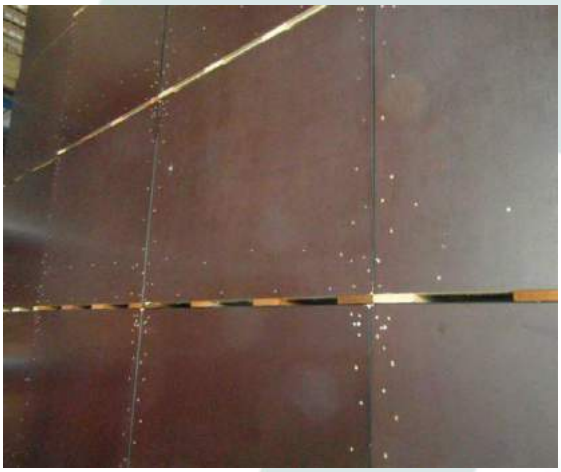

Dry air extracts moisture from the product and moist air escapes per layer out of the product.

# Box drying installations bulk

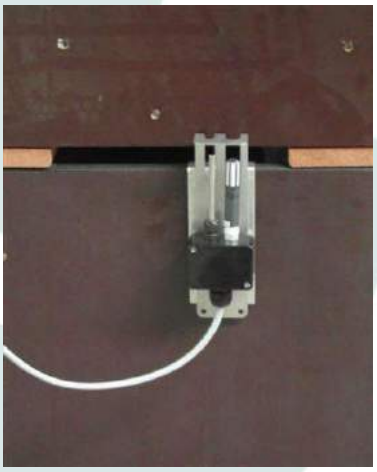
Example of installation for 2 rows of boxes, 5 boxes high. Heated by central heating on hot water radiator

Overview drying installation for 2 sections with central heating.

Connection of tubes to radiator inside the air distribution installation.



Outlet of moist air out of the product between the box levels.



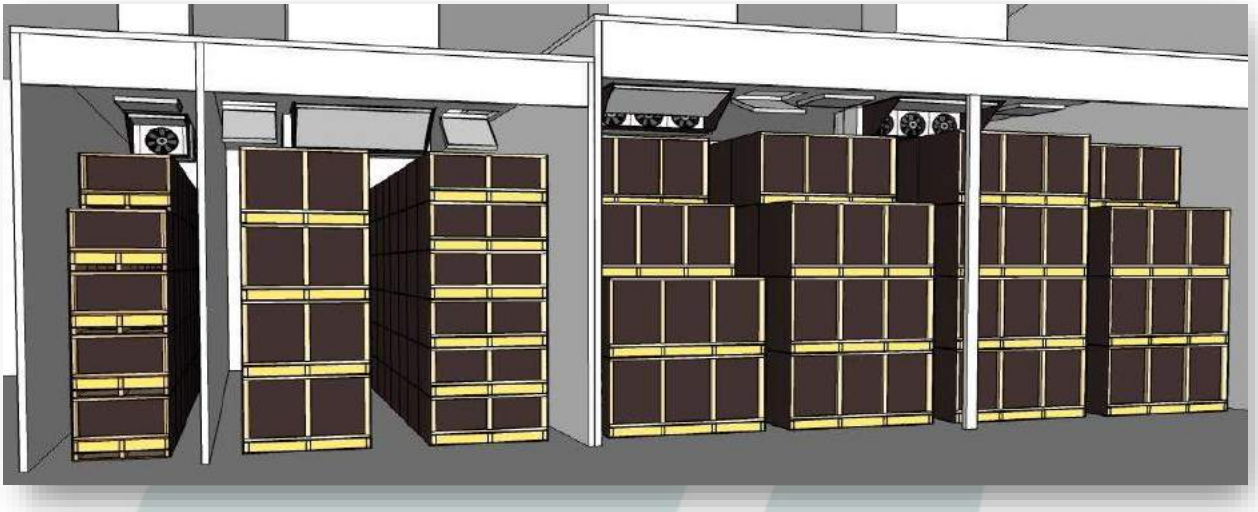
Measuring T°+HR of out coming air which is related to the product.


Example drying box with double pallets: ventilation and transport. Box with plywood with coating.


Example of box from plywood with larger volume; different sizes are possible up to 2000 ltr.

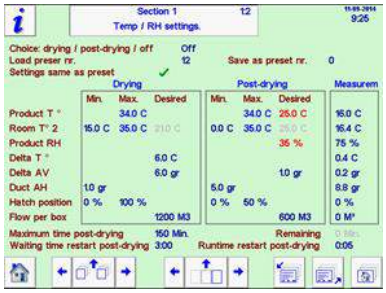
# Conditioned drying in drying rooms

In areas with a high humidity level, drying with outside air is very limited. The drying process of seed with crop ('on straw') proceeds slowly and demands a lot of energy. Closed cells with a cooling-drying installation (heat pump) provide a solution and save a lot of energy. The cells are built around the drying installation.



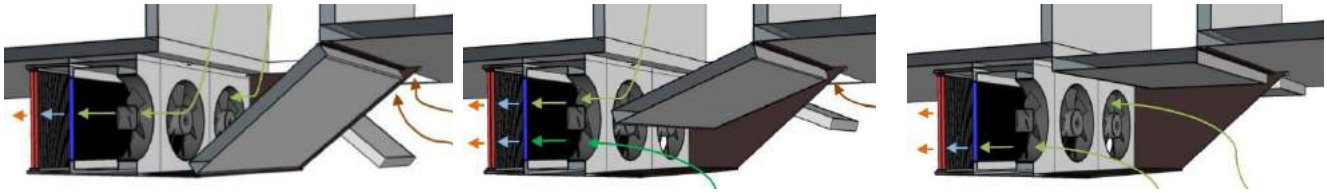
Depending on the needs and use, the lay-out and measurements of the cells are determined: 1 or more row of boxes per cell or 1 large cell with drying on 2 sides, 3-4-5-6 boxes stacked high. Volumes up to 30 or 40 m³ per row are possible.

A cooling block hangs within the cell, which suctions the air through a hatch from the outside to the inside. The suctioned air is cooled down through the unit to achieve the desired moisture content in the cell. Above the fan a heating battery is placed to heat up the air to the desired temperature per row. It reduces the RH and the air can absorb the humidity from the product. Excessive heat can be discharged to another section, another cell or externally. An external heating source can be used to create additional heating rapidly.

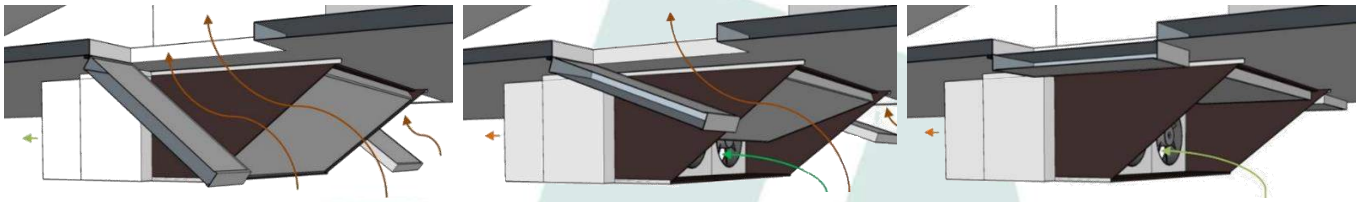



The advanced ABC processor controls the whole installation and dries the seed to the desired moisture content; the most suitable (dry) air (outside or inside air) is suctioned. The air will be cooled down to achieve the desired Absolute Moisture Content (AH, in gr/kg of air) of the air, using condensation. Afterwards the air will be reheated so it is able to absorb more air. The air from the product will become drier than the outside air, and internal air is automatically used for the remaining drying process.

# Conditioned drying in drying rooms

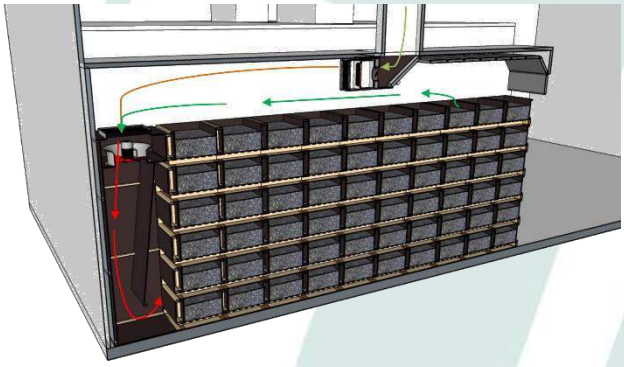


When the product is moist and/or the outside air is dry, outside air is aspirated (on the left). When the air in the cell becomes drier than outside, inside air is partially used (in the middle). When the outside air is too moist or the air from the product is dry, only inside air is used for the drying process (on the right).

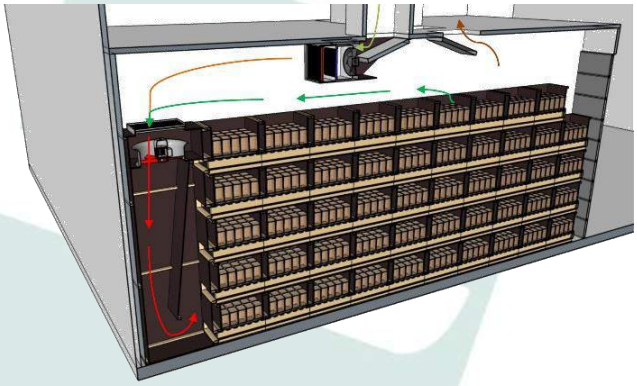


Next to the cooling-drying units, hatches are placed to discharge humid air. They are connected to suction hatches; 100% outside air means 100% opened position (on the left), 50% recirculation produces 50% discharge (in the middle) and with complete recirculation the discharge hatches are closed (on the right).

In narrow cells or wide cooling-drying units, the outlet hatches are placed behind the inlet hatches.

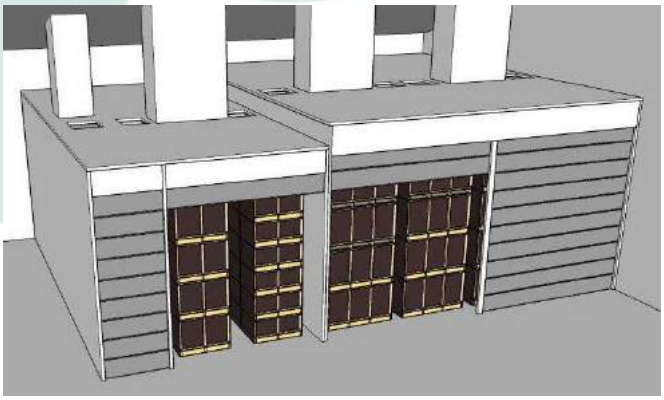


The box width and height depend on the product. Low boxes for seed in bulk, high ones for plants with seeds.



Low boxes for plants in little bags or seeds in cotton bags.

Overhead doors facilitate optimal use of the cell capacity.



The lay-out and design of the cells with boxes are client-specific. We will advise you.

# Seed humidification in boxes

When the seeds are too dry during harvest, they are too delicate and will give less profit. An option is to increase the moisture content of the seeds. It is important that this is carried out correctly. Ensure the supplied moisture is absorbed well by the seeds, and the desired moisture content can be controlled.

The simplest humidification method is to press air, in the form of very fine mist, through the seeds using an (ultrasonic) humidifier. In this case the problem is that the water is not really absorbed by the air, but float through the air as drops of water. However small the drops might be. This is comparable to mist; you get wet because the drops of water fall down on you. This way, the seeds, mostly at the supply side, will also become wet on the outside. Only over time the seeds will absorb the moisture. This can be harmful for the seeds and leads to an irregular seed moisture content.

When you use the humidification equipment of Agratechniek, the moisture would be absorbed by the air. There will be no more drops of water in the air. The Absolute Moisture content (AH: absolute humidity, grams of water per kilogram of air) will then rise. The seed humidification process will take place inversely to to the drying process; the dry seed wants to be in equilibrium with the more humid air. The seeds absorb the moisture from the air without the seeds becoming humid.


Humidifier in closed cell with internal circulation.

Our humidification equipment enables correct control of the desired air AH. It increases the seed moisture content to the desired moisture content in a controlled manner. By relating the AH of the ingoing air to the AH of the outgoing air (Delta AH), the moisture content in the entire box will increase evenly. This prevents the supply side from becoming to humid in relation to the seeds where the air exits. Seeds that absorb moisture slowly (beans), will have a lower Delta AH than seeds that absorb moisture faster.

The humidification process is recommended in a closed space. In this case, the moisture content in the space can be brought to the AH value where the seeds can reach the desired equilibrium moisture content. You can opt for an installation with only humidification, or a combination including a seed drying option. Ventilation system with integrated humidification and drying option.

# Seed humidification in boxes


Ventilation system with humidifier and drying option.

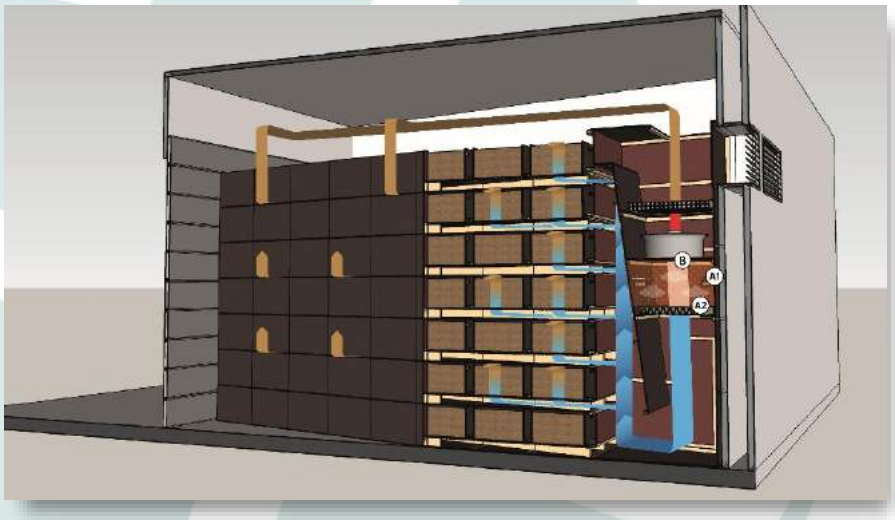
During the humidification process, the humidifier blows humid air to the air distribution system. At that system the humid air is blown through the seeds

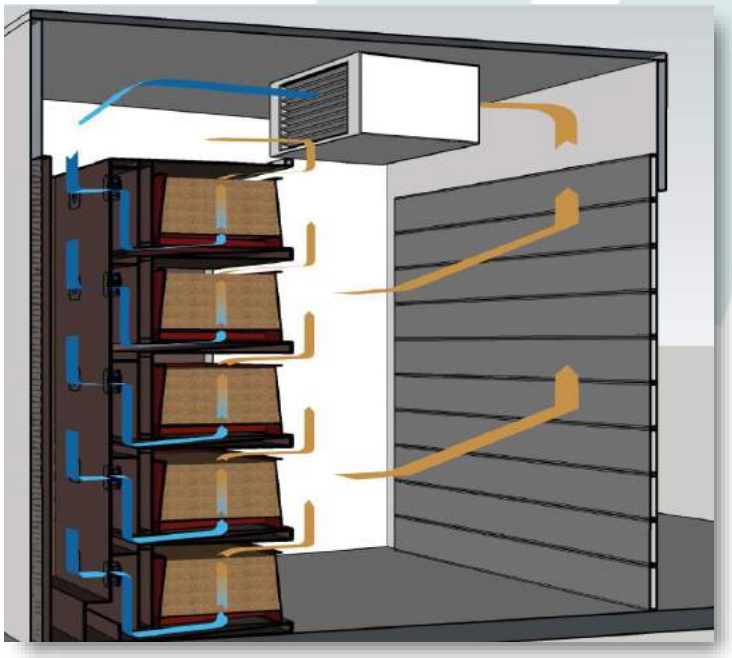
Besides humidification, the same installation can also be used for seed drying. The ventilation system will be produced with a valve to suction the outside air and heating to heat up the air.

Ventilation system for humidification or drying.

The ventilation system can be also be produced with equipment to humidify the seeds directly.

All circulation air will be supplied with extra moisture.



Humidifier in closed cell circulation for individual boxes.

There are different options to utilize your existing boxes for humidification. This version is manufactured to client specifications.

On the left an example with steel boxes, which are aerated individually. The humid air is suctioned on the rear side and circulates through the seeds.
This process is also possible together with seed drying.

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# Drying and storage boxes for seed

High drying box for coarse seeds and rough seeds on straw. Drying boxes for small seeds; 2/3 high (top) or half-high boxes (right side). Corner post and middle brace are mounted outside; this means no extra gaps inside of the box.

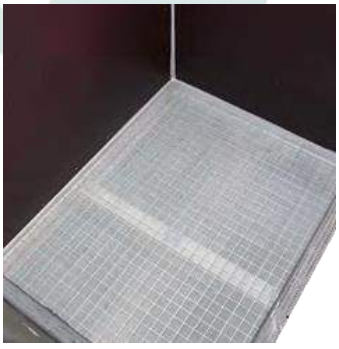
Drying boxes made out of water resistant board; several models and dimensions.

Corner post and brace inside of the box means extra gaps. Seeds will stick in these gaps. Extra cleaning work to avoid contamination.

Big surface will increase drying speed with enough volume. (up to 2m3 with 60cm seed layer).

Higher pallet will decrease the air resistance. In case of high airstream an optimal air distribution to all box layers.

Drying box with slatted base with fine screen on top.



Drying box with grid and fine screen on top. 100% breathable.

Drying box with perforated screen for coarse seeds (beans, maize, etc).

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# Drying and storage boxes for seed

Boxes can be piled Pallets up; space saving.

Pallet with steel protection.

With extra provision, pallet can be turn over by fork lift truck in a safe way.

Box cannot move between the pile. The pallet cannot be damaged. Smooth dosing of seed.

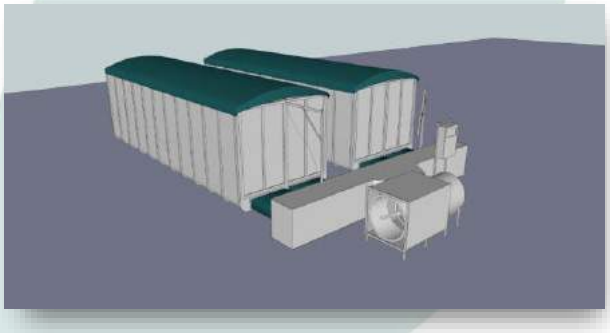
# Drying seeds and grains in containers

Agratechniek delivers measurement and control equipment to automate drying systems for seeds and grains. Use the ABC processor software to automate the drying process for every system. Agratechniek works together with your supplier/manufacturer in order to run your drying process optimally.

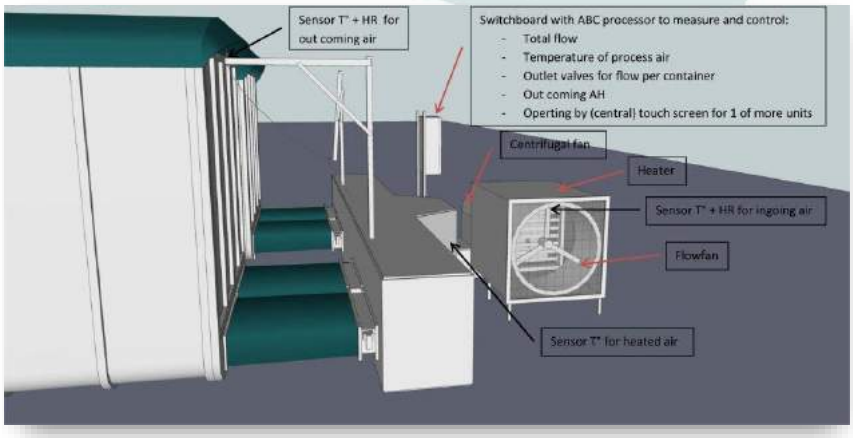
Drying sections with fan, air distribution duct and connections to the containers.

Principle of drying section installation

- Air distribution duct
- Fan
- Heating



Stand with measurement sensor for air from the containers. A various number of containers per section is possible




**Various measurements for automatic drying:**

- T° + RH of air from the container; calculation absolute humidity content (AH)
- T° of ingoing heated air
- T° + RH of the suctioned air; calculation absolute humidity content (AH)

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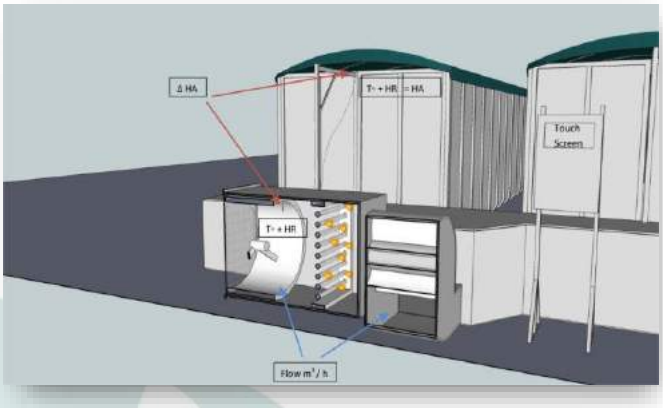
# Drying seeds and grains in containers

Cross-section of flow fan, heating (fired directly) and fan.

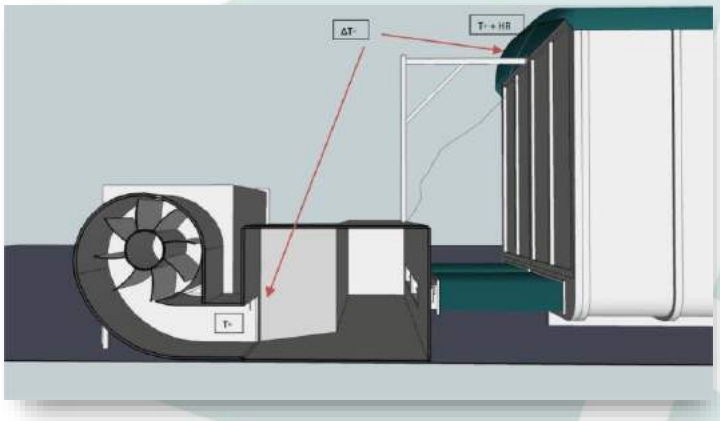



Flow fan: air quantity depends on the number of containers and drying stage.

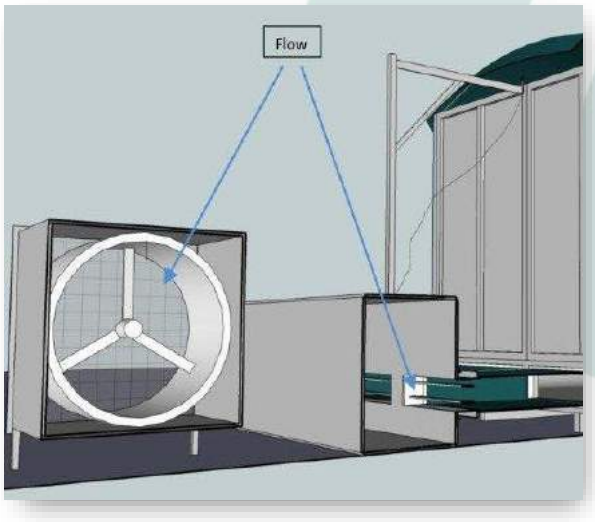
- The flow fan controls the number of revolutions of the fan for the correct air quantity.

Controlled drying process for calculation moisture difference;

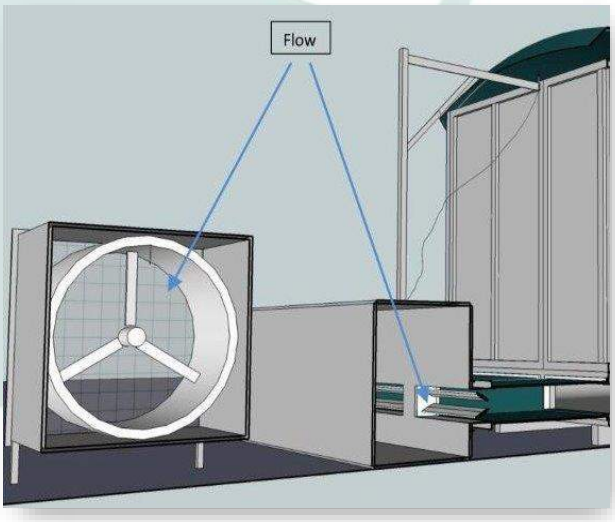
- Outgoing AH (T°+RH) – ingoing AH (T°+RH)
- When the difference is too little, a lot of air is not cost effective. The air quantity will decrease.



The T° of ingoing air is checked at the fan. This can be related to the discharging air (DeltaT°); the product can be heated up controllably and uniformly, which leads to little difference in product temperature between the lowest and highest layer. The drying process can take place in various temperature steps. The correct T° per stage will save a lot of energy.




The air inlet is opened automatically and the air quantity (fan capacity) increases automatically.




When the seeds start to dry, the last remaining moisture with a gradually decreasing air quantity is discharged until the desired moisture content of the seeds has been achieved; the air outlet will therefore gradually close and the air quantity will decrease.

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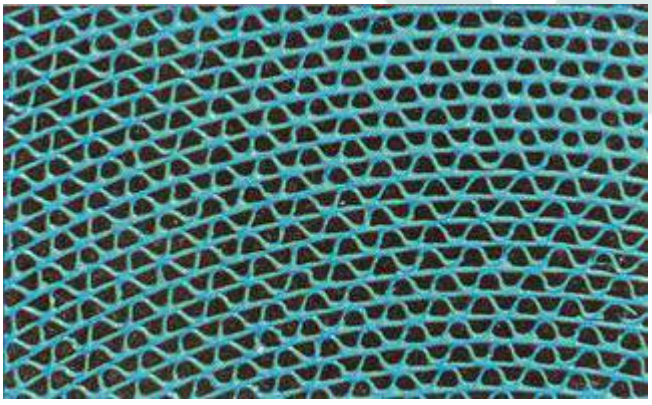
# Drying with dehydrated air

Dehydrated air by adsorption or special Hybrid dryers.

**Description rotor**
The centre of a dehumidifier is the rotor or adsorption wheel. This part consists out of a chemical bound silica gel that can absorb moisture out of the air that passes through the rotor but can also release moisture during the regeneration process.

After the regeneration process the rotor is ready to absorb moisture again.

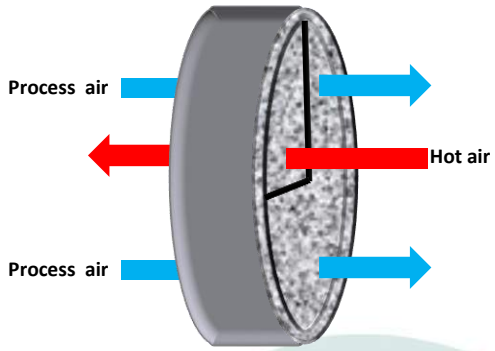


The structure of the rotor looks like honeycomb pattern with a lot of small air channels. All these air channels make a big adsorption surface which takes care of the dehydration of the air that passages the rotor; the silica gel absorbs water from the air.

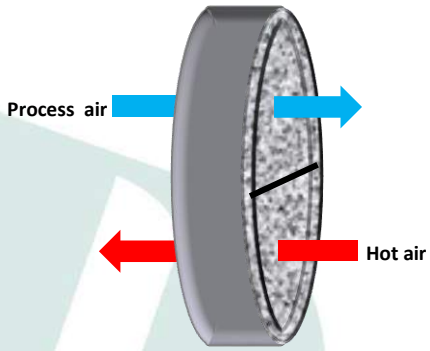
# Drying with dehydrated air

**Regeneration of the rotor**

The silica gel in the rotor cannot absorb water unlimited. Nevertheless the adsorption process is a continuing process. To make the adsorption process a continuing process the construction of the rotor is designed to absorb water at 75 or 50% of the total surface of the wheel. 25 or 50% (depending the T° of the regeneration air) of the rotor is used for regeneration (drying the rotor).



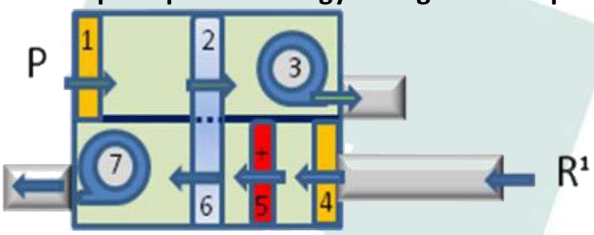

Rotor with 75-25 configuration; regeneration by hot air (150°C) from gasburner ad 25% of the rotor surface.



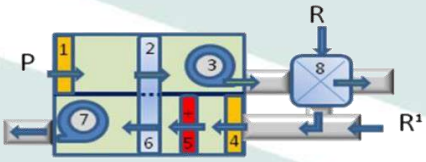

Rotor with 50-50 configuration; regeneration by warm air (60°C) from hot water battery or condensor.

By rotating, each part of the rotor will absorb water and will later being dried by regeneration. The regeneration section is isolated from the adsorption section. By blowing hot air through the regeneration section, the absorbed water will be removed from the rotor. The moist regeneration air will be evacuated through air-channels to outdoors.

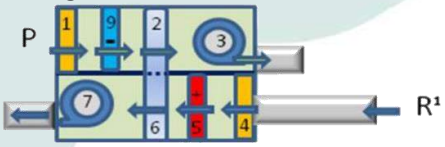
**Several principles for energy savings and temperature control**



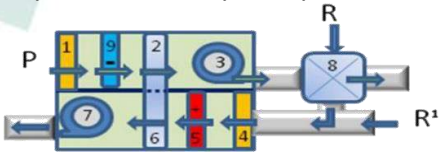

**P:** Moist process air into the air dryer
**1:** Process air will be filtered
**2:** Process air will be dried by the rotor
**3:** Dry and (warm) process comes out of the air dryer and can be used for drying products.
**R:** Regeneration airflow to dry the rotor
**4:** Regeneration air will be filtered
**5:** Regeneration air will be heated (60° or 120-150°C)
**6:** Regeneration air will dry the rotor
**7:** Moist regeneration air will be evacuated to outdoor.
**8:** Heat exchange unit




**Option I)** 8: Heat exchange unit brings proces air T° down to the ambiant level + 3°C. Free coming energy will be used to warm up regeneration air; Energy saving.




**Option II)** 9: Cold water battery (chiller) with modulated capacity can cool down the process air to any desired T°C. Hybrid system




**Option III)** Combination 8+9: Energy saving and reaching any desired T°C for out coming process air. Hybrid system with heat-exchange.

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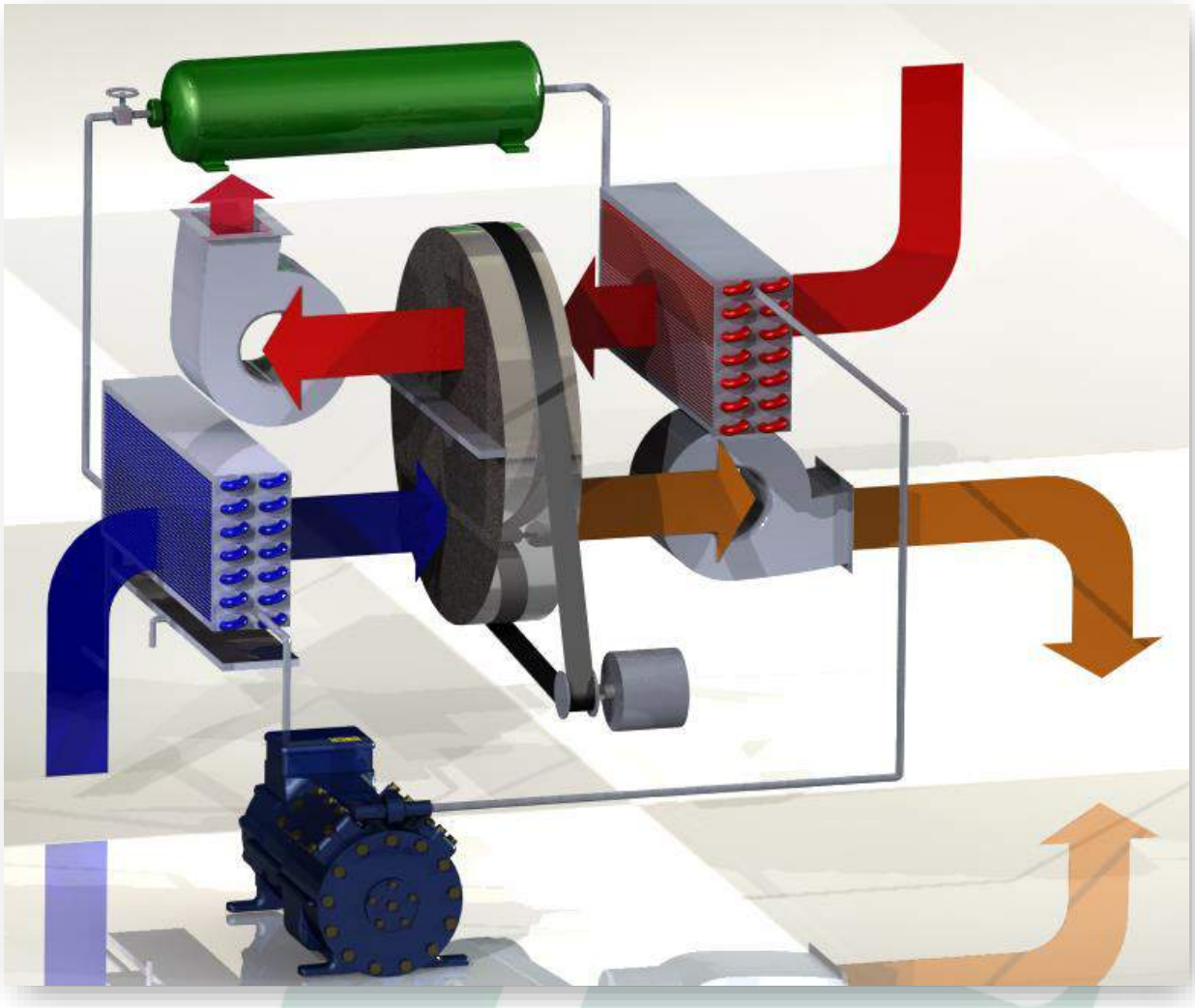
DRYING INSTALLATIONS & EQUIPMENT

# Drying with dehydrated air

**Economically and modulating drying of air; The hybride principle**



**Hybrid heat pump with cold water**

The hybride air dryer is specially developed to create very dry air with an constant (low) temperature of the process air. Process air is first being cooled, so water in the process air will Condensate on the evaporator. After this, the process air at 100% HR will be dried to a low level by the Adsorption rotor. Because of high HR, the capacity of the adsorption rotor is at it's maximum. The capacity of the evaporator is modulating; The process air will be cooled to a level by which the out coming process air is at the desired T°.

Regeneration air will be heated by the condenser (heat-pump) and an additional radiator with hot water. Less external heating is needed and all energy will be used; energy saving!

The rotor will be dried by this hot air. A heat-exchange unit in the outlet of the regeneration air can pre-heat the extracted (cold) air for regeneration; extra energy saving!

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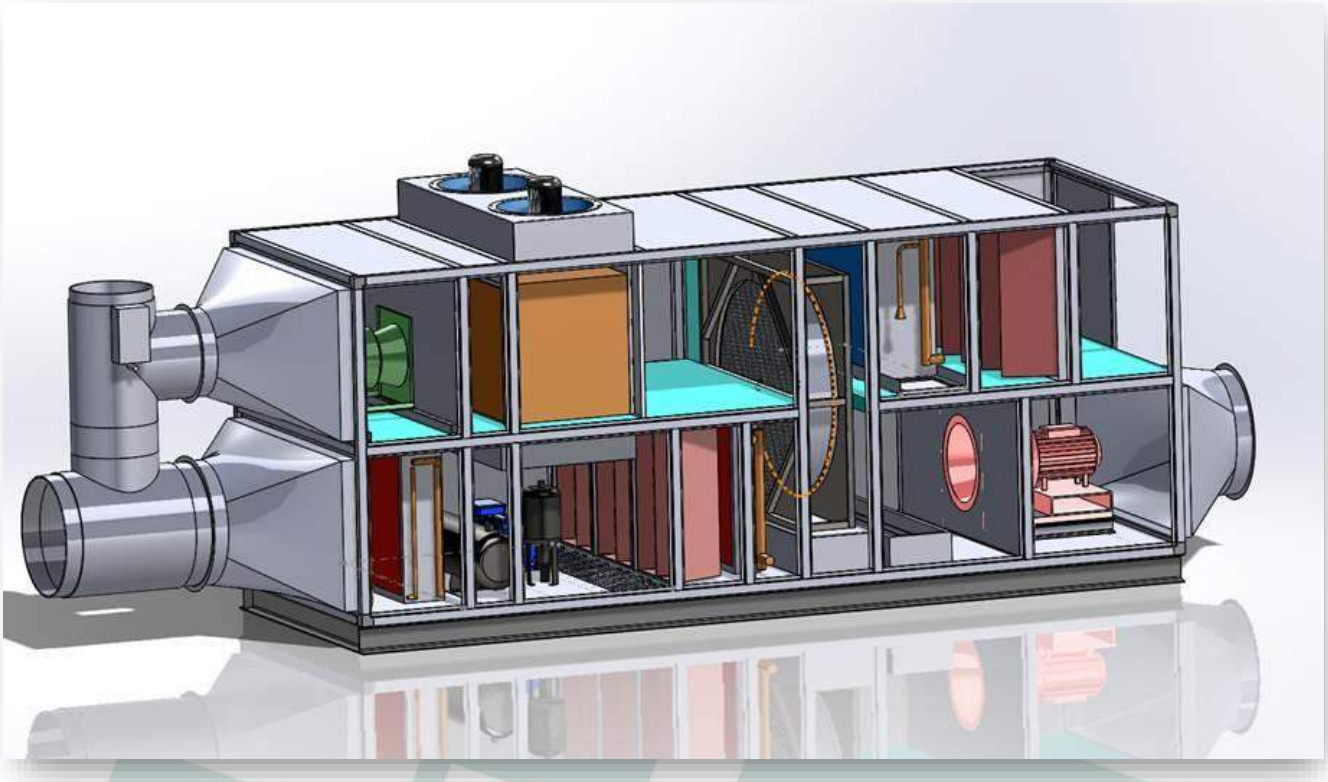
DRYING INSTALLATIONS & EQUIPMENT

# Drying with dehydrated air



**Hybrid heat exchanger**

Hybride installation with heat-pump en heat-exchange units. Automatically extraction process-air direct from outside or by heat-exchange unit for maximum energy saving. Modulating heat-pump for 100% result in summer and winter.

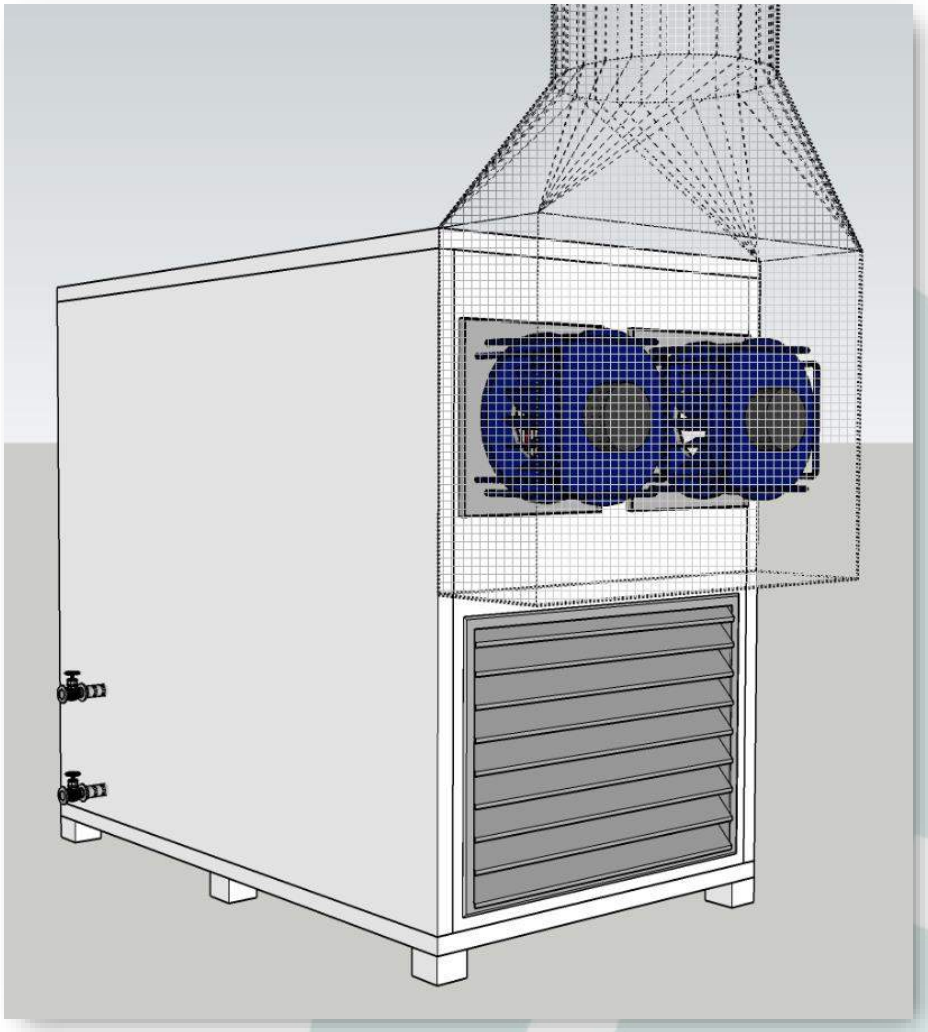
Big advantage of adsorption air dryers is that the maintenance costs and frequency for services is low.

Different air dryers can be used in several occasions where dry air is needed. We have mentioned some possibilities above. The final implementation and capacity depends which parameters are required. Regeneration process can be done by gas burner, hot water radiator or condenser (with extra radiator). Temperature can be controlled by installing a modulated air-air cross-exchanger, a cold water battery which must be connected to a cold water chiller or by a heat-pump installation. All controlled by the ABC processor.

Energy can be saved by installing a (modulating) air-air cross heat exchanger in the process air stream. The optimal and most economical air dryer is the ACR dryer from Agratechniek; When very dry process air (down to 1.5 gr/kg air) is needed at a low T° (down to 15-20°). Modulating capacity and energy saving!

# Air drying by condensation

To allow quick and efficient drying of seed or grain to a low moisture content, the incoming air must be sufficiently dry. When the condition of this air is not optimal, the drying process will take too long and the desired moisture content of the seed will not be reached. By drying the air first, the moisture content of the air is reduced and the air will be able to absorb more moisture from the seed.



A method to extract moisture from the air is through condensation. Air contains energy; A part is used to keep water molecules in the air (moving), the rest (free energy) warms the air up.

When we take energy from the air, the free energy decreases first and the air will cool down.

After the free energy is extracted, the energy for the water molecules will decrease. These molecules then descend like water droplets at the coolest spots.

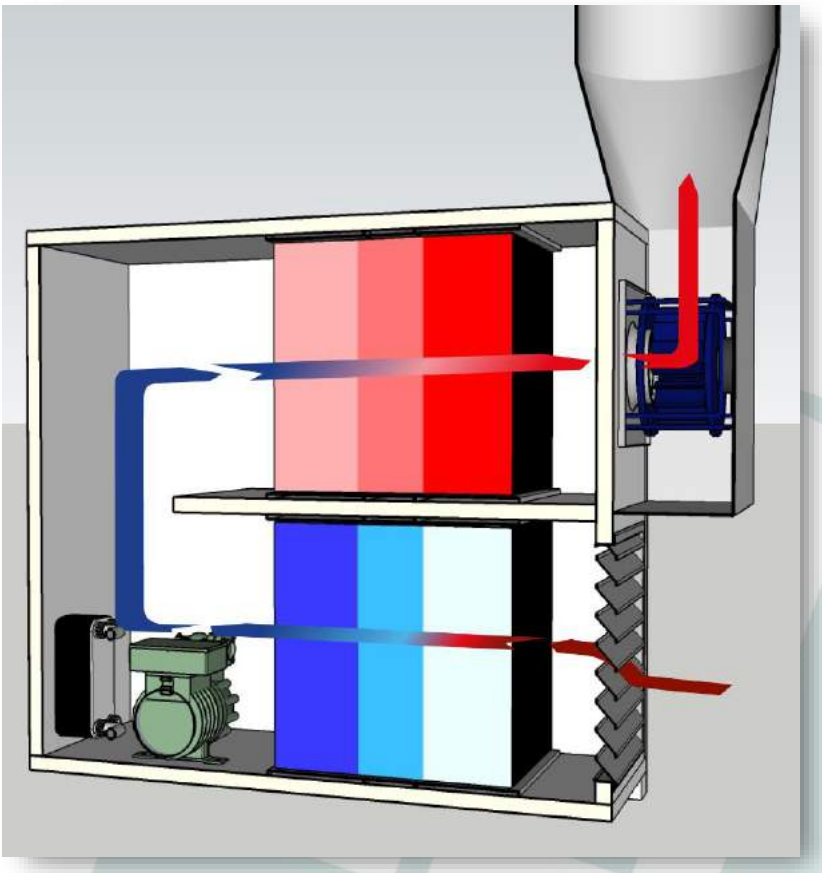
The ACD installation; at the bottom the intake grille and above it the exhaust duct with fans.

Example: air of 27°C (80.6°F) with an RH of 60% contains 13.6 grams of water per kg (approx. 1.15m³) air. By cooling this air to 19°C (66.2°F) the free energy is extracted and the moisture can still remain in the air; the RH rises to 100%. When more energy is extracted, less moisture can remain in the air and the moisture will condense; the air becomes drier. At 6°C (42.8°F) the air can still contain a maximum of 5.8 gr of moisture. In this way the moisture content is reduced by almost 8 gr / kg of air.

With a heat pump, the extracted energy can be delivered to the same air again. This extra energy then ensures that the air warms up and more moisture can be absorbed; the RH drops.

Example: when the air with 5.8 gr of moisture is heated up to 27°C (80.6°F), the RH will drop to 25%. With this air, moisture can quickly be extracted from the seed and the seed will be dried to a low moisture content; carrot seeds down to 7% and wheat to 8.5%.

# Air drying by condensation



With the Agratechniek Condensation Dryer (ACD) installation, the incoming air is cooled down considerably. Condensation makes the air drier.
The air is then reheated to the desired temperature and blown towards the drying installation. Where the air is used to dry the seed.

The ACD installation is designed in such a way that the air can be cooled down considerably, with relative small compressor capacity; from 35°C to 6°C. The air then contains 5.6 gr of moisture.

With this drier air, less energy is needed to keep the remaining water molecules in the air. So there is energy left and that energy is released in the form of heat.

For the drying of seed, both dry and cool air is preferred. This means that not all energy may be released into the air after cooling. In ACD installations, excess energy is drained via a heat exchange unit by a hot water circuit. Connection on the side. The air is then drier and has a lower temperature. It is possible to use the hot water in the drying installation or for other purpose.

**ABC central air control**
The ACD installation is controlled by the ABC processor. The desired air moisture content and the desired temperature are achieved automatically. With the ABC central air control, the dried air is then released where it is needed at that moment. For each drying section, it is automatically determined whether the extracted outside air needs (extra) dry air. If necessary, dried air is added. Thanks to the ABC central air control, the investment made for an ACD installation quickly becomes profitable. The same ABC control can redirect the excess energy to where it is needed or can be used. That saves a lot of energy.

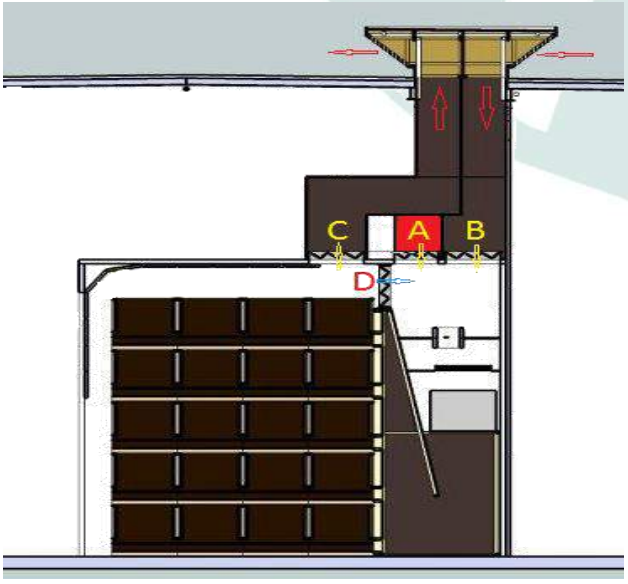
**Specifications:**
- The ACD installations are available in different capacities; 25-150 Ltr/h.
- The ABC central air control makes one ACD installation much more cost-effective than several small air dryers.
- The amount of dried air is variable.
- The temperature of the dried air is variable; it is possible to dry with colder air.
- Outside temperature of e.g. 35°C (95°F) can be cooled to 25°C (77°F) and dried by 30%.
- Thanks to the unique configuration, an ACD installation requires relatively little electricity.
- The ACD installation is movable and easy to install (plug and play).
- The released excess heat is removed with a heat exchanger.
- This heat can easily be used for other purposes or be blown outside.

# Central air dryer with ABC processor

The air drying process is an expensive business; this applies not only to condensation and adsorption dryers, but also to the hybrid dryers of energetic interest (combined condensation and adsorption drying). It is not economical to place an air dryer at every drying installation. Continuous drying does not take place at all installations, and dried air is not required constantly.

**On the right:** Central hybrid air dryer

Agratechniek has developed a principle at which a **central air dryer (1)** brings the dried air to where it is needed **(1A)**. Various drying installations **(4, 5)**, Cabinet dryers (static **(6)** and rotary **(7)**), conditioning cells **(2)**, drying tables **(3)** or packing machines **(8,9)** are connected to a central air duct **(1A)**. Thanks to the advanced ABC process the dried air is discharged automatically to where it is needed at that moment.


During the seed drying process, a lot of moisture can be discharged using heated up outside air. Unfortunately the conditions of the outside air are not always suitable to reach the desired equilibrium moisture content at the end. Especially now that more seed companies want to receive, store and package the seed with a lower moisture content. To be able to dry the seed quickly and successfully, dried air is needed in the last phase.

**Example of drying/conditioning cell:**

A. Supply of dried air
B. Aspiration of outside air
C. Discharge of moist air
D. Return of dry air from the cell (recycling)

This principle can be achieved for each type of dryer

# Central air dryer with ABC processor

On the right an example of a central air channel for 4 drying sections. At the front the valve sections for inside air, and at the back the distribution channel for dried air.

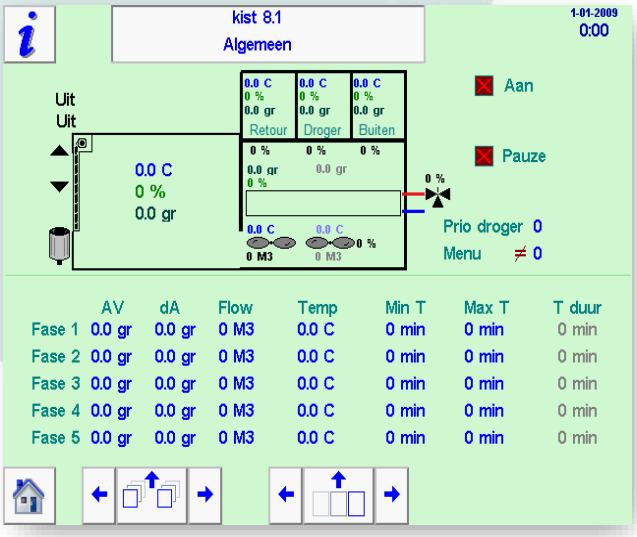
By mixing the dried air with outside or inside air, the desired Absolute moisture content (AH) can be reached precisely.

Furthermore, the existing drying installations can be supplied with dried air, using a distribution channel. The dried air mixes with the outside air inside the aspiration channel to achieve the desired lower moisture content.

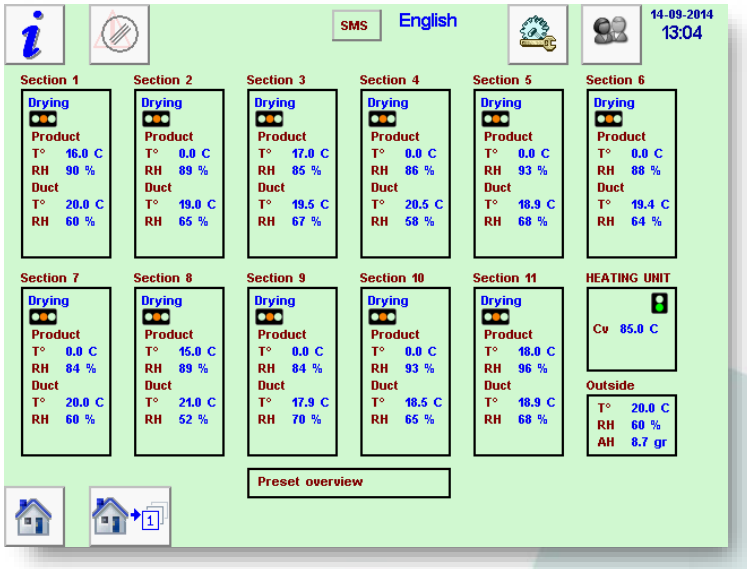
The decreasing fan capacity will enable the process air to become drier, and leads to a seed drying process with a low moisture content.

On the right an example of the ABC control for separated boxes; per box and per phase, the desired AH, air quantity and the desired T° are set. This enables the process to pre dry per box with a lot of air and a higher temperature at the start, after which in the last phase the remaining moisture is discharged at a low temperature, with extra dry air and a small air quantity.

**Per type of drying installation and air dryer, a specific ABC control is applied.**



# Examples of ABC software




For each type of drying installation, Agratechniek has developed unique ABC software. With this software, the equipment is controlled and the desired settings are managed to achieve the desired drying result. The regulation is specifically made for each installation.

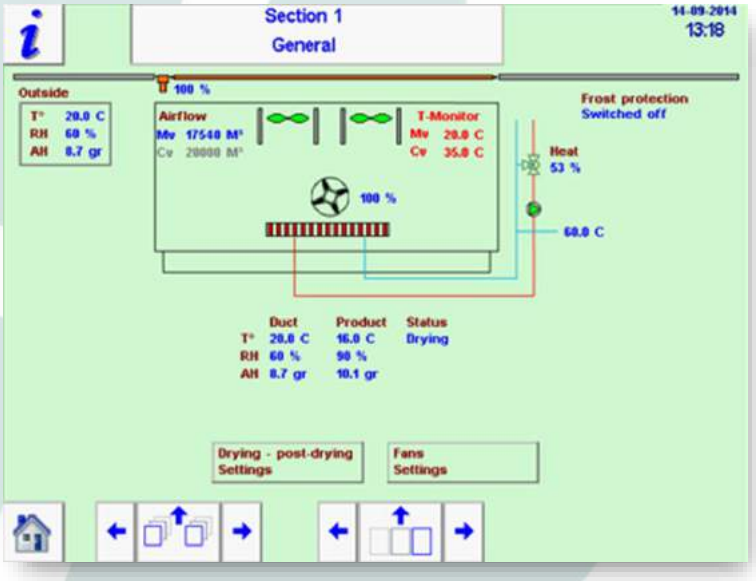
On the left an example of a drying installation with 11 sections `stacked box drying' with central heating.

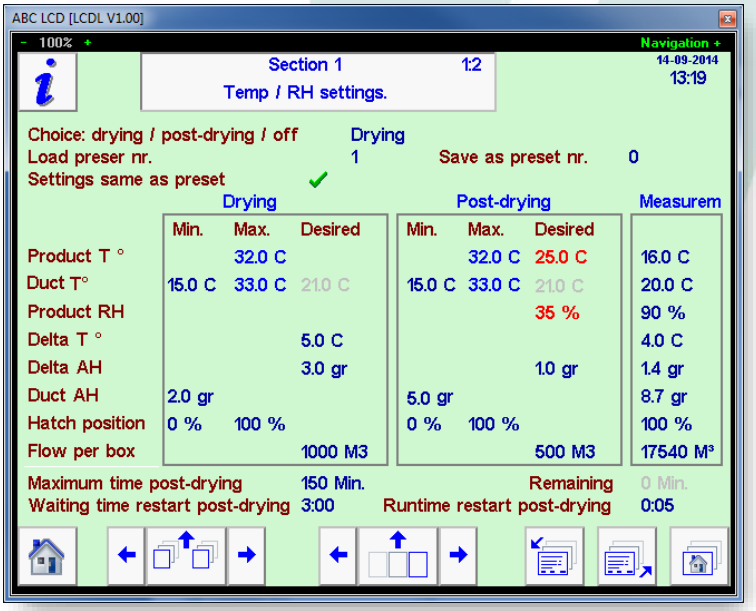
Per section information is visible about the statuses and the measured values.

By clicking on a section on the main page, the control for this section opens. You will see information on the measured values. The activity and status of the equipment is also visible; % control, color and possible movement.

The desired settings page is immediately opened by pressing on different areas.

All types of ABC software are very visual and informative. This makes the configurations understandable and easy to operate.




By clicking on 'Drying - post-drying settings' this page is opened immediately.

This page also clearly shows the setting values and measured values.

Very useful is the possibility of using `preset numbers'; 33 menus with specific drying configurations can be stored and simply be called up again.

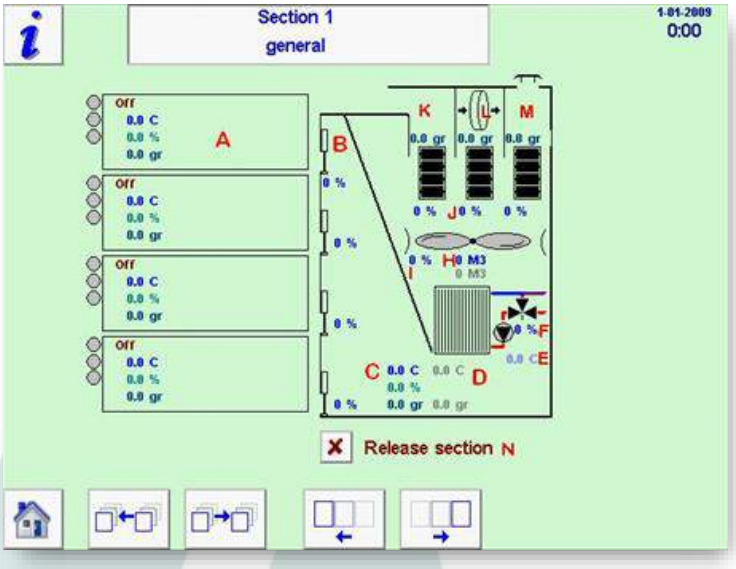
These visualization and possibilities are applied in all ABC programs for controlling different types of drying installations.

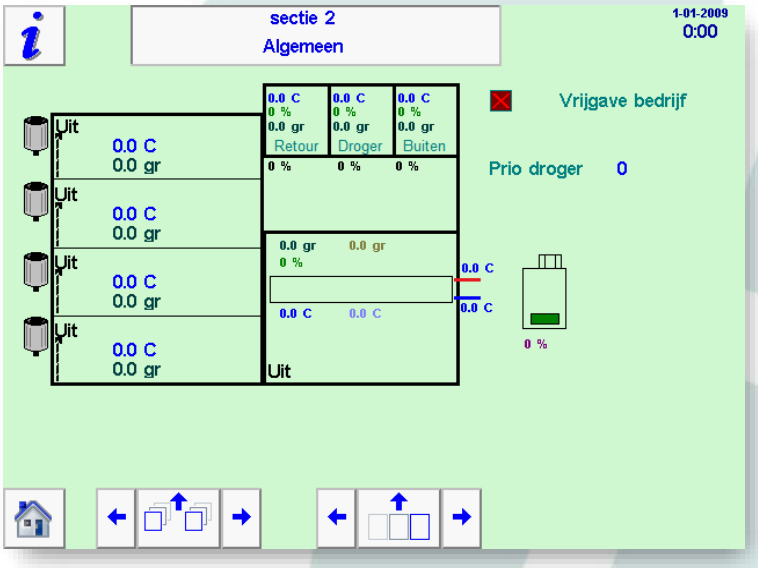
# Examples of ABC software

On the right is an example of an arrangement where for each individual box the seed can be dried to the desired moisture content.

This schematic drawing shows the cross-section of the installation. This concerns a drying section where boxes are placed in an open rack (A).

Here the data is also visual and informative; for each item the action and status is clearly visible. Complete with various control and measurement values.




A similar installation can be found on the left. Another section, but this time a closed drying installation.

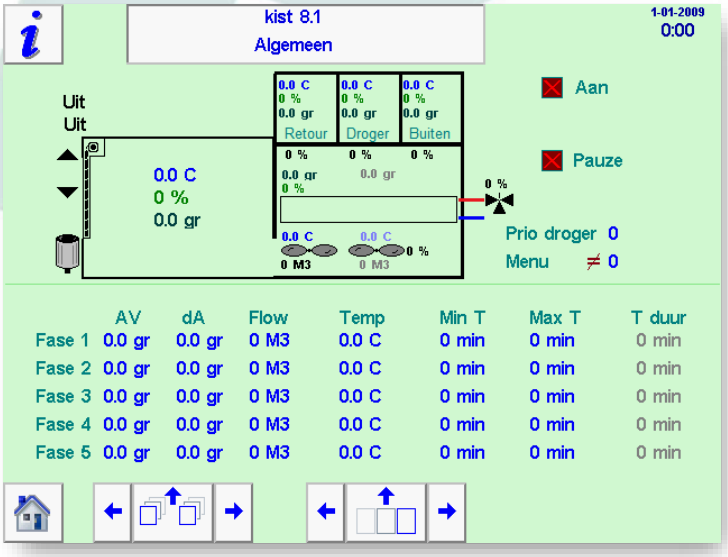
The air is sucked in per section and distributed to the boxes. All boxes have the same incoming temperature. The air volume and the desired moisture content is set per box.

A variant of this arrangement is shown below.

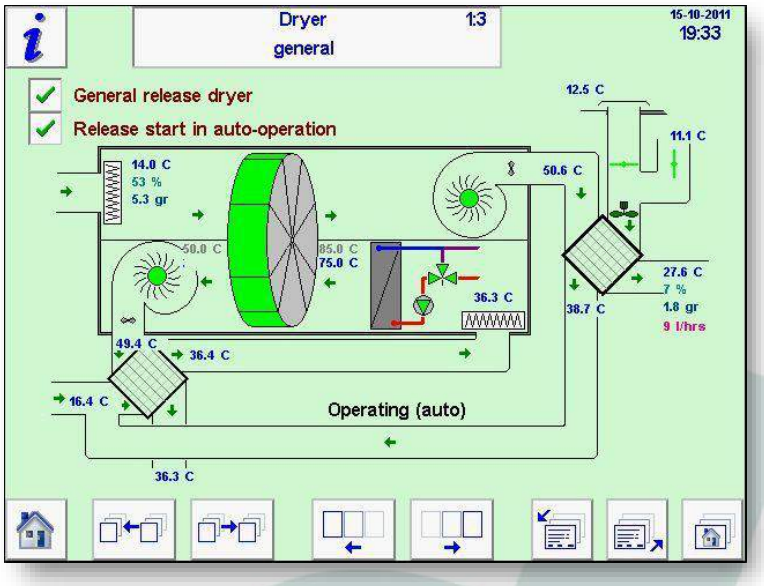
Here, the temperature is also being set for each box. And it is determined at box level whether the air can be moved outside or is being reused in the process.

These were 4 examples of ABC applications to control and configure different kind of installations. There are many more variants.

We can also build the software to optimize and automate your existing drying installation. For new and existing installations, the goal is to automatically achieve the desired moisture content.



# Examples of ABC software



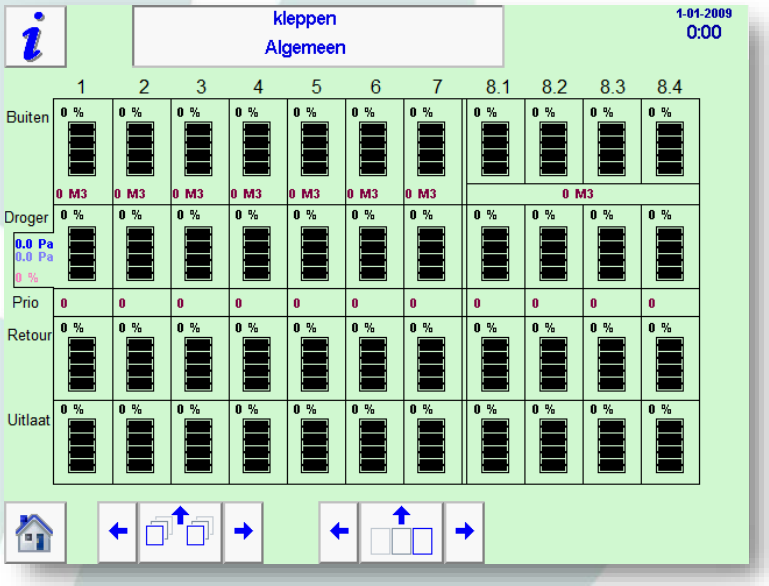

The ABC-processor gives detailed visual information about real-time measurements and actual settings. Colours are used to clarify this.

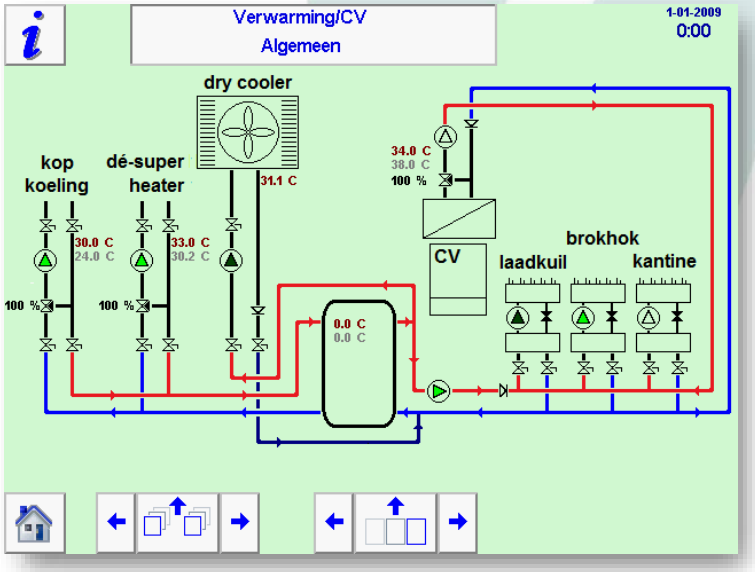
Here is an example of an information window used for adsorption air dryer with heat exchange-unit.

Here you can see an overview of the control of the dried air. The position of different valves are shown per section:

- Outside air
- Dried air
- Retour air
- Outgoing air

Depending on the priority and desired moisture content, the valve settings are calculated per section.




Here is a hydraulic flow diagram of the ABC-control for a drying installation with a heat pump.

With this regulation the excess hot water is distributed over different places where some extra (free) heat can be used.